



**ENVIRONMENTAL HEALTH PROJECT**

# **ACTIVITY REPORT**

**No. 30**

Issues and Options for Transfer of Water  
Distribution Responsibility to Local Government  
Structures in the Bushbuckridge, Hazyview, and  
Nsikazi North Areas of South Africa

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## ACRONYMS

<b>BOTT</b>	<b>build-operate-train-transfer program</b>
<b>BWB</b>	<b>Bushbuckridge Water Board</b>
<b>CDO</b>	<b>Community Development Officer</b>
<b>CRDC</b>	<b>Community Reconstruction and Development Committee</b>
<b>DC</b>	<b>District Council</b>
<b>DWAF</b>	<b>Department of Water Affairs and Forestry</b>
<b>DWAF/M</b>	<b>Department of Water Affairs and Forestry, Mpumalanga</b>
<b>DWAF/NP</b>	<b>Department of Water Affairs and Forestry, Northern Province</b>
<b>EHP</b>	<b>Environmental Health Project</b>
<b>IDP</b>	<b>Institutional Development Project</b>
<b>kl</b>	<b>kiloliter</b>
<b>Km</b>	<b>kilometer</b>
<b>l/c/d</b>	<b>liters per capita per day</b>
<b>LRDC</b>	<b>Local Reconstruction and Development Committee</b>
<b>MCA</b>	<b>Ministry of Constitutional Affairs</b>
<b>MI</b>	<b>megaliter</b>
<b>NGO</b>	<b>nongovernmental organization</b>
<b>O&amp;M</b>	<b>operations and maintenance</b>
<b>ODA</b>	<b>Overseas Development Administration (U.K. agency)</b>
<b>PSC</b>	<b>Project Steering Committee</b>
<b>R</b>	<b>Rand, the local currency (Exchange rate: R4.48300 = US\$1.00)</b>
<b>RDC</b>	<b>Reconstruction and Development Committee</b>

<b>RDP</b>	<b>Reconstruction and Development Program</b>
<b>TAT</b>	<b>technical assistance team</b>
<b>TLC there are</b>	<b>Transitional Local Council (elected local autonomous unit of government; four TLCs in the BWB service area)</b>
<b>TRC is one</b>	<b>Transitional Representative Council (elected local units of government; there TRC in the BWB service area--Nsikazi North)</b>
<b>UFW</b>	<b>unaccounted-for water</b>
<b>USAID</b>	<b>United States Agency for International Development</b>
<b>WHO</b>	<b>World Health Organization</b>
<b>WRDC</b>	<b>Ward Reconstruction and Development Committee</b>
<b>WSA</b>	<b>Water Support Authority</b>
<b>WSO</b>	<b>water service organization</b>
<b>WSP</b>	<b>Water Service Provider</b>

# EXECUTIVE SUMMARY

## BACKGROUND

*The topic of this paper is transfer of responsibility for water distribution services from a central governmental agency to local government structures in a northeastern area of South Africa.*

Responsibility for community water supply is one among many services that are being shifted from the central government to local government. Currently all water supply is under the regulation of the Department of Water Affairs and Forestry (DWAFF), reformed in July 1994 to include homeland areas. Five local government units – Bushbuckridge (North, Midlands, and South), Greater Hazyview, and Nsikazi North – are candidates for devolution of authority for water services, when deemed capable of local administration by District Councils and the Provincial Department of Local Government. Hazyview, which was already a township, has retained autonomous status but must incorporate a neighboring area, Ward 2, and expand water services to it.

Under South Africa's Reconstruction and Development Program, DWAFF drew up a project to begin to address this mixture of water supply technical issues and institutional/ administrative matters. It was one of 12 water projects approved in September 1994 and the only institutional development attempt in the water sector. The Bushbuckridge Institutional Development Project was assigned to Rand Water as implementing agent, to be managed by its Community Based Projects Department. The project began in October 1995.

An evaluation of the whole project by the Overseas Development Administration (ODA) pointed out that the first phase of the project, however experimental and tentative, had succeeded in building awareness among DWAFF, project steering committee members, local communities and others about the complexities of the transfer and the need for local participation. Data on social structures as well as existing water management structures were generated and technical information assembled.

The evaluation team made 20 recommendations, including a suggestion for a bottom-up, demand-driven approach, which this review (by an EHP team) maintains is yet to be achieved. As a direct result of discussions following the ODA evaluation, a framework for the future of the project was established among the principal actors. Three separate but interlinked interventions were agreed to by DWAFF and the steering committee for the project:

1. A build-operate-transfer-train (BOTT) program to establish the **Bushbuckridge Water Board** (now termed the Bushbuckridge Water Board Establishment Program) as bulk supplier. Rand Water was assigned the role of implementing agency.
2. An **operations and maintenance project**, also assigned to Rand Water but not yet approved (the proposed business plan is under review), calls for Rand to provide interim operations and maintenance of the existing water treatment plants and boreholes that DWAFF currently supervises, pending transfer to a functioning Water Board.

3. **An institutional development program (IDP) to provide technical assistance to local government units in the formation of appropriate structures for retail operations of distribution systems (i.e., to households and standposts).**

While the first two interventions are assigned to an implementing agent (Rand Water), the IDP has yet to begin funded activity.

#### Demographic Information

Local Authority	Estimated Population	Number of Communities
Bushbuckridge North TLC	258,000	28
Bushbuckridge Midlands TLC	227,000	42
Bushbuckridge South TLC	373,000	25
Greater Hazyview TLC	53,000	5+Hazyview
Nsikazi North TRC	148,000	15
TOTAL	1,059,000	115+Hazyview

Source: Preliminary report on Bulk Water Supply for the Bushbuckridge area, Strategic Plan, September 1997, AFRICON, et.al.

An interim coordinating committee was re-formed in July 1997 to begin to address the transition needs of local government. Following the ODA evaluation of the first phase of the IDP, USAID offered to assist Rand Water, as the implementing agent, in the process of capturing lessons learned and reformulating the original project along the lines suggested by the evaluation. The current study, which is referred to as the issues and options report, is the result of that assistance. It is designed to help local government decide how to move forward. The report has been produced by the Environmental Health Project (EHP), a Washington-based support mechanism under the direction of USAID's Office of Health and Nutrition. The interim coordinating committee (and the local

government representatives who serve on it) are the primary audience for this report.

The project area of this study is densely populated. The population figures in the above table should be considered only as indicative. Discussions with knowledgeable professionals suggest that the estimates could easily be in error by more than 10%; demographic data in the area are not precise. In some cases, even community names are not standardized, with the old farm names used interchangeably with village names.

Existing water supply infrastructure falls into two major categories: 1) bulk water systems designed to provide water from surface sources to multiple communities and 2) borehole sources designed to provide water to individual

communities or parts of communities. Both are important potable water sources as only 75 of the communities are connected to the bulk water supply network, and not all of them receive water reliably from the system (i.e., 24 hours per day, or in quantity adequate to meet the needs of users).

Many factors affect the potential transfer of water supply to local governmental structures.

- # Most communities do not have reliable water supply service.
- # Unauthorized connections to the bulk infrastructure system and to community distribution systems have a significant impact on overall system performance.
- # Borehole sources of water are unreliable.
- # Incomplete information about the existing bulk water system, community distribution systems, and borehole water supplies hampers planning for system development and for the transfer of authority to the Water Board and local authorities.
- # The current poor condition of the overall water supply system will complicate transfer of assets and responsibility to the Water Board and local authorities.
- # Current operation, maintenance, and repair programs and practices are not sufficient to maintain the water supply infrastructure to acceptable standards.
- # Local authorities, which will ultimately be responsible for water supply provision, are not adequately involved in the planning process.
- # Infrastructure development plans do not appear to address citizens' desire for household connections.
- # The goal of providing a reliable amount of water through the bulk

water supply system to all communities is many years away.

- # Local authorities do not fully understand important technical issues related to system planning, performance, maintenance, and repair.
- # Local authorities currently do not have the capacity to operate, maintain, or repair the facilities which they will become responsible for.
- # Division of responsibilities within the DWAF has changed frequently, and the jurisdictional responsibilities between its offices in the Northern Province and Mpumalanga appear to confuse local officials, contractors, and indeed even the DWAF staff.
- # While DWAF's policy is to turn over responsibility to local government for water services, it is not clear how long this process will take or the specific mechanisms that will be used to accomplish transfer.
- # Local government officials are unclear about how the secondment process for staff transfer to local government will work or about their right to refuse to take on any particular DWAF staff.
- # Resources for transfer have not been provided to local governmental structures, and the prospects for income generation are weak.
- # Land titling issues complicate the potential for viable local government in the project area.
- # The jurisdictional status of Bushbuckridge as a part of the Northern Province continues to create confusion.

There are at least three potential ways that local government authorities can structure their future water service organization:

- # direct (local) administration model

- # municipal company model
- # contract operations and maintenance model

Local government authorities can operate their water distribution service either as a water department in a typical town or township (appropriately linked to community water committees), or they could set up a municipal company (complete owned by the local government). As a third option, the water organization could be operated in the form of a contract with a private firm. Each of these operational models and their strengths and weakness are described in Chapter 3. No particular model is recommended over another, but the municipal company model may have potential for being the most effective option, given the size of the populations to be served. Each local government will need to decide which approach is most suitable for its circumstances.

Several criteria should be considered in structuring the new water service organizations (WSOs):

- # operational autonomy: ability to manage without interference in daily operational decisions
- # responsiveness to consumers and ability to link with existing community structures
- # efficiency: capacity to achieve economies of scale and operate economically
- # capacity to grow and transform
- # ability to manage staff without outside interference
- # flexibility to meet growth requirements and to address complex management issues
- # ability to operate with a self-contained budget

An illustrative expenditure budget of a hypothetical WSO has been constructed as a guide to local authorities for their future planning. Fully staffed and providing water to a hypothetical population of 300,000, the total annual expenditure of the WSO is estimated at R15.325 million. Calculations in the hypothetical case indicate that it would be financially quite difficult for the WSO to introduce a phased program of metered stand connections if subsidies are phased out over as short a period as five years. Break-even tariffs would be unacceptably high under the most realistic assumptions, and more acceptable tariff levels would generate crippling operating deficits for the organization. Even if subsidies were extended to 8 or even 10 years, break-even tariffs would be moderately high, but perhaps not so prohibitive.

The lowest feasible monthly payment levels generated in the calculations, with varied length of time for subsidies, were in the range of R60 to R80 per month per household. This figure was reached with subsidies being phased out over a period of 8 or 10 years, rather than the currently announced 5 years. If the bulk water purchase price paid by the water service organization were to double to R2.00 per kl not an unreasonable figure these average monthly water bills would increase by half. Although these projections (and the other, higher estimates under various scenarios) appear to be unacceptably high, further study of the matter may not support that conclusion. The only documented evidence available to the EHP team suggested that some households might accept a monthly payment of R20 to R40 for good quality water service (of unspecified volume). Households acceptance of monthly water bills in the range of R60 to R80 if that were indeed

the eventual break-even tariff might actually depend as much on the quality and reliability of the improved service as on cost.

The EHP team arrived at the following conclusions about the approach and resources needed to move forward on the transfer of services:

- # Local authorities will need assistance in making the transition from the present to their future full responsibility for water distribution.
- # Transformation will require specific financial and specialized human resources.
- # In order to move forward, the problem must be defined as developing capacity for water distribution structures rather than as generically developing local government or building community capacity.
- # The most appropriate organization to support the development of WSOs at any level is the DWAF.
- # Relationships among all the key stakeholders are critically important. Roles need to be kept clear throughout the transition.
- # The specific strategy for transfer of water distribution to local authorities will need to be developed, as will a structure for implementation beyond present efforts.
- # The capacity-building program should be focused on local authorities and community organizations, and the most appropriate skills available locally should be strengthened with assistance from a number of sources.

The goal of the transformation program should be to develop the capacity of future water distribution organizations and community-based

water management services in the Bushbuckridge, Greater Hazyview, and Nsikazi North project area. The purpose is to provide improved access to water services for the populations in the project area while improving local capacity for sustainable and participatory management, and ultimately improving the health of the population.

The program as proposed in this report aims to strengthen human resources, develop systems, structures and procedures, and provide commodity support (offices, equipment). Performance improvement efforts should be divided into several component areas (each area will need specific advisory support):

- # organizational development and structuring
- # human resources development: training in managerial skills, including financial management, personnel and administrative systems development, supervisory skills, program management, and strategic planning
- # consumer and outreach services
- # community water management structure development
- # technical skills training

Several short- and medium-term actions are recommended:

- # *Short-term actions*
  - Revitalize the project coordinating committee and legitimize it.
  - Disseminate this issues and options report.
  - Refocus the strategic plan for the Institutional Development Project.
  - Clarify the funding process for the project and determine availability of funds.

- # *Medium-Term Actions*

Conduct a follow-up review of this report.  
Further develop a program design for the transformation process, and

develop the details in a project design and scope of work; develop terms of reference for the proposed technical assistance team.

Conduct an open solicitation and publish a request for proposals to procure a technical assistance team as a contractor (not an implementing agent).

Further develop a program design and project activities for The Transformation Program for Developing Local Government and Community Capacity for Water Distribution in the Bushbuckridge, Hazyview and Nsikazi North areas.

Set up a subcommittee of the project coordinating committee (at this time, it should probably become the project steering committee) for project management. This could include a local government representative, an RDP representative, a DWAF representative, a TLC/TRC representative, a Water Committee representative, and the team leader for the technical assistance team (once engaged).

Begin implementation of the The Transformation Program for Developing Local Government and Community Capacity for Water Distribution in the Bushbuckridge, Hazyview, and Nsikazi North areas.

# 1 INTRODUCTION

## 1.1 Background

### A Government in Transition

South African transition policies and programs are designed to support the formation of democratic local structures and institutions, with devolution of authority for community services from central ministries and former homeland administrations to newly formed local government structures. The Reconstruction and Development Program (RDP) frames the policy and program structures for this process. This fundamental change was initiated by the Government of National Unity in April 1994. Community water supply is one service, among many, now being put into the hands of local government. Currently all water supply is under the legal regulation of the Department of Water Affairs and Forestry (DWA), reformed in July 1994 to include homeland areas. National policy requires bulk supply of treated water by large regional service providers, called Water Boards. In large urban areas, Water Boards have operated for many years as cost-effective, commercially oriented providers; until recently, none have been set up or operated in former homeland or rural areas. It remains to be seen if financial viability will be possible in marginalized, poor rural areas.

### The Project Service Area

The service areas discussed in this report will be provided water in part by a new unit, the Bushbuckridge Water Board or BWB, to be created within the next two years. A variety of water treatment plants, direct river extraction for irrigation, and boreholes exist in the Sabie River and Sand River watershed in northeastern South Africa. The catchment area drains from the Drakensberg mountain range escarpment, crossing jurisdictional and provincial lines, and leads into the Kruger National Forest Reserve. Groundwater availability decreases with distance from the escarpment towards the east. The service area comprises the political jurisdictions of Bushbuckridge (North, South, and Midlands), Greater Hazyview, and Nsikazi North areas.

The RDP has structured new jurisdictions, combining former homelands and townships with traditional white farming communities and towns. Such is the case in the future BWB service area where two former homelands (Lebowa and Gazankulu) have been combined to form (provisionally) Bushbuckridge North, Midlands, and South. The District Council in Pietersberg, located in the Northern Province some three hours distance by automobile, administers local government units in the Bushbuckridge area. Hazyview, a traditional white farming and tourist center at one major entry point to the Kruger National Forest Reserve, has been combined with a neighboring peri-urban area on the east and south side (Ward 2).

Nsikazi North is an area of densely settled rural villages north of the White River area (a traditional white town) and is the former Kangwane homeland. Greater Hazyview and Nsikazi North belong to Mpumalanga Province and are administered by the District Council in Nelspruit.

### **The Transition Scenario for Turnover to Local Government**

The local government units of Bushbuckridge (North, Midlands, and South) and Nsikazi North are candidates for devolution of authority for services but must be judged capable for local administration by District Councils and the Provincial Department of Local Government. Hazyview has retained autonomous status but must incorporate Ward 2 and expand water services to it. DWAF's policy is to turn over responsibility as soon as technically and financially possible within the next five years, but the transition process has not been designed, nor funded in most cases, and will likely require a much longer time frame. As illustrated in Figure 1, when turnover takes place, legal responsibility for distribution of water, sanitation management, and purchase of bulk water from the BWB will be required. In addition, administration of self-contained boreholes within jurisdictions and management of small water treatment plants will be handled locally. Decisions on precisely which water treatment plants will be given to the Water Board and which will be given to local government have not been made. DWAF's policy requires that all newly constructed infrastructure be turned over within one year of completion to either Water Boards or local government. Should local government not be capable of managing

the system, DWAF is required by law to do so.

### **The Complications of Jurisdictions in the Service Area**

The transition period is characterized by role confusions and overlapping and misunderstood responsibilities in the provision of services. Chapter 2 describes current institutional structures and technical arrangements for water supply in more depth. In the BWB service area, local government units are new and are attempting to set up services with little support and almost no financial base. Politics complicate this process. The people living in Bushbuckridge have felt ill-served or even abandoned by the geographically and politically distant Northern Province District Council. In June and July 1997, strikes, road blockages, and general disturbances took place along the main road transversing the Bushbuckridge area. There was a general call to separate Bushbuckridge from the Northern Province<sup>1</sup> and attach it to the Mpumalanga Province to the south, where people have traditionally related to the capital city, Nelspruit, as their main urban center. This matter continues to be under review at higher levels and appears

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<sup>1</sup> Interviews with RDC and other officials indicate that a political understanding was reached (referred to as the World Trade Center Agreement) soon after the 1994 elections that Bushbuckridge would be transferred to Mpumalanga Province. Consequently program initiatives to support both local government and civil society structures from Nelspruit began with vigor and promise in 1995, assuming the area would be a part of Mpumalanga. These efforts have dwindled as it became increasingly clear that this understanding would not be acted upon. Northern Province attention to the area has not been forthcoming and a wait and see attitude towards the Bushbuckridge area has prevailed.

to be at a political impasse. A proposal has been put forward by the District Council in Pietersberg to form the Bushbuckridge area into a separate district of Northern Province, but this has not been acted upon. The fate of Bushbuckridge continues to be in limbo, according to interviews conducted in Pietersberg and Nelspruit. Given this situation, governmental authorities are reluctant to invest in and support the area with economic development activities or efforts to strengthen local government.

### **A Stop-Gap Approach to Meet Needs Is Inadequate**

DWAF is legally charged with making water available to all citizens (either directly or through implementing agents such as Water Boards or contractors). DWAF's orientation is engineering and public works rather than retail

**Figure 1  
Transition Design**

distribution and community involvement. Where DWAF must operate and maintain systems itself, it does so primarily through contracts with engineering firms. However, DWAF has inherited the O&M staff in the service area from the former Homelands Administrations and is currently operating small treatment plants and borehole pumps directly until it is able to pass staff over to new local government water departments or the new Water Board, or to contract for operating services until turnover is possible. A management audit conducted by Ernst and Young in the service area (commissioned by DWAF through the BWB establishment project and its implementing agent, Rand Water) indicated there are approximately 870 staff inherited from the Lebowa and Gazankulu Departments of Public Works.

A large dam project (Injaka Dam) is under construction to provide bulk supply and agricultural water for a portion of the service area, but drinking water will probably not be available from the dam for three or more years. In reality, water supply service in the project area is very inadequate, and a major planning effort is underway along with stop-gap measures until the new Injaka Dam project is operational. Short- to medium-term efforts include four small water infrastructure improvement projects and refurbishment contracts to rectify a maze of inadequately installed systems and transmission lines riddled with unauthorized connections.

In the absence of adequate service in the past and present administrations, many rural communities have formed water committees, drilled boreholes, and set up small distribution standpost

systems with the assistance of private nongovernmental organizations (NGOs), such as the Leon Foundation Water Programme and Mvula Trust, supported by DWAF. Water is free of charge in most rural communities and in some of the larger towns.

Intermittent and inadequate supply requires community water fetchers to cue up for long periods to receive the daily allowance at borehole-supported public taps. Diesel motors often run out of fuel, and communities wait passively until something is done.

Urban systems with meters (such as the town of Hazyview) collect tariffs. Some rural villages have boreholes with sufficient water to install distribution systems to individual yard connections, which are not yet metered. Communities that have been delegated autonomous status may retain water fees; direct administration communities must pass on collections to DWAF. Most local government units in the service area under study do not collect tariffs for water and have no incentive to do so. A general assumption that water is provided free of charge has evolved in the former homelands areas, and local politicians do not believe people should be required to pay unless service is upgraded and adequate water is provided and appropriately metered and billed.

### **The Institutional Development Project**

Once the changes in governmental approach and structure were initiated in 1994, DWAF quickly designed a project to begin to address this mixture of water supply technical issues and institutional/administrative matters, one

of 12 water projects approved in September 1994 and the only specifically institutional development effort in the water sector. DWAF had little experience with rural water supply and was not familiar with the area or the social and political context; new governmental policies did not clearly define responsibilities. The Bushbuckridge Institutional Development Project, which began in October 1995, was assigned to Rand Water as implementing agent, to be managed by its Community Based Projects Department. Rand Water is a Water Board which supplies the urban area of Johannesburg and Pretoria. It is the largest bulk supplier in the country but has had little experience with rural, peri-urban areas until recently. As with other projects quickly launched in early days of RDP, the Institutional Development Project for Greater Bushbuckridge and Northern Mpumalanga Local Government Water Supply, as it is formally called, encountered a number of growing pains and spent its first 18 months learning how to operate within the newly emerging and transitional structures and defining technical and institutional needs.

An evaluation of the project<sup>2</sup> by the Overseas Development Administration (ODA) pointed out that the first phase of the project, however experimental and tentative, had succeeded in building awareness among DWAF staff, project steering committee members, local communities, and others about the complexity of the issues and the need for local participation. Data on social and existing water management structures

were generated and technical information assembled. The project received relatively low marks on communication, clarity of purpose, and building upon local structures. Local water councillors had increasingly begun to participate both during and soon after the evaluation period, and this held promise in the eyes of the evaluators.

The ODA evaluation team made 20 recommendations, including a suggestion for a bottom-up, demand-driven approach, which this current review team feels has yet to be fully accepted. As a result of discussions following the ODA evaluation, a framework for the future of the project was established

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<sup>2</sup> The ODA evaluation is commonly referred to as the Rees report after one of its authors, Professor Judith Rees of the London School of Economics. (See Rees 1996.)

## Figure 2 IDP Project History

among the principal actors. As illustrated in Figure 2, three separate but interlinked interventions were agreed to by DWAF and the steering committee for the project:

1. A build-operate-transfer (BOT) program to establish the **Bushbuckridge Water Board** is funded through the Government of South Africa's RDP effort, with Rand Water as the implementing agent (now termed the Bushbuckridge Water Board Establishment Program). Rand Water is charged with developing a Water Board institution and leaving in place a viable technical and administrative operating body which can function on its own as a public sector company (parastatal entity). The BWB Establishment Program will assume operations and maintenance of existing bulk water treatment facilities in the area at a future date when DWAF judges the BWB capable of operating and maintaining the infrastructure.
2. Under an **operations and maintenance project**, also assigned to Rand Water but not yet approved (the proposed business plan is under review), operations and maintenance of the existing water treatment plants and boreholes that DWAF currently supervises will be provided by Rand on an interim basis until BWB or local government units can pick up the function. This O&M project is primarily a management services contract. The staff of DWAF now working in the area will work under this contract, supervised by Rand, until they are seconded and assigned to local government units or the new Water Board.
3. An **institutional development program (IDP)**<sup>3</sup> will provide technical

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<sup>3</sup> A note about terminology. Broadly speaking, the Water Board establishment process is an institution-building activity with a combination of technical and managerial development activities required for bulk water supply. A program to support local government in its structuring of the water services function is also an

assistance to local governments (often referred to as the Technical Assistance Program) in the formation of appropriate structures for retail operations of reticulation systems.

While the first two interventions are currently assigned to an implementing agent (Rand Water), the IDP has yet to begin funded activity. At the moment, there are questions from DWAF and the Ministry of Constitutional Affairs about which agency should be responsible for strengthening local governmental capacity for water distribution. DWAF staff in Mpumalanga believe that the Ministry of Constitutional Affairs (MCA) has jurisdiction for local government and should appoint an implementing agent for the activities related to local government capacity-building. However, it is unclear if the MCA has the funding to undertake this task. (DWAF currently has USAID grant funding for these activities.) A project design and a terms of reference will be required for this activity.

### **USAID Involvement in Support of the IDP**

The USAID Mission to South Africa has provided a grant to DWAF to support Rand Water's Community Based Projects Department in its initial implementation effort for the Bushbuckridge IDP. The grant's purpose is to ensure adequate access to water supplies and sanitation services to the people of Bushbuckridge and the Mpumalanga Province project area through the creation of appropriate water management institutions. USAID's technical assistance goals are to assist

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institutional development activity; it is aimed at consumer relations, administration, finance, and operations and maintenance on the retail water level.

project activities identified in the original IDP. The broad aims of the grant do not limit funding to the Water Board Establishment Programme (listed above as intervention number 1). Assistance is also available to local government (listed above as intervention number 3) in project strategy assistance, training, and capturing lessons learned. It is also designed to help local governmental structures to select the appropriate institutional options and to strengthen project staff and emerging institutional structures in performance requirements in technical areas of application.

Following the ODA evaluation of the first phase of the IDP, USAID offered to assist DWAF and Rand Water (as the implementing agency) in the process of capturing lessons learned and reformulating the original project along the lines suggested by the evaluation. USAID, which draws upon centrally funded technical resources for assistance of this nature, called in the Environmental Health Project (EHP). EHP was created by USAID as its technical assistance arm for water and sanitation strategic activities worldwide, among other functions. EHP operates through a contract consortium supported by the Office of Health and Nutrition in USAID's Global Programs Bureau.

In May 1997, USAID requested that EHP staff and/or consultants attend a strategic planning workshop conducted for the interim working group of the IDP to disseminate some of the lessons learned by EHP and its predecessor project during 17 years of sectoral activity around the world, particularly in building water institutions. The action plan which came out of the May workshop identified the need for an institutional options study on ways to strengthen local administrative structures for water supply, among a number of

other aims. EHP drafted terms of reference for this study. USAID asked EHP to conduct the study because the organization has extensive experience in this area and has no vested interest in a particular outcome. In July 1997, the interim working group reviewed the terms of reference and agreed to the appointment of EHP to conduct the study.

## 1.2 Scope of Work for the EHP Team

The purpose of the EHP activity was to assist the Coordinating Committee, representing the BWB service area s Transition Local Councils (TLCs) and Reconstruction and Development Committees (RDCs), in deciding the appropriate mechanisms for providing water service delivery consistent with national policy and community goals. The activity aimed to identify issues and constraints, and to suggest a way to move forward in the transition process toward local administration of water supply. The study was in essence a fact-finding mission to assemble information and to suggest suitable structures for establishing an appropriate water service delivery system. The study included an examination of the financial, technical, organizational, human resources, and social/community needs and requirements to be met. Consideration was given to appropriate management entities that could join TLCs together to provide more cost-efficient and responsive services.

A draft issues and options report was required prior to team departure from South Africa. A two-month reading and study period was anticipated so that the Coordinating Committee could work with each local government to fully understand the suggestions made in the

report. Following that, a dissemination workshop will be held by EHP for the Coordinating Committee. The final issues and options study (this document) and the subsequent decisions by the five TLCs will create the framework for a project for institutional development for the water distribution and sanitation functions. The follow-up workshop will seek to develop consensus for specific options. A detailed project design for implementation of the local government IDP may be developed as a result of this report and the subsequent workshop, but this possibility is not currently approved as an activity by either USAID or the Coordinating Committee.

## 1.3 Methodology

To undertake this study, a team of four senior EHP consultants, working with a variety of local resource people, was assembled for a four-week period. The EHP team applied a rapid appraisal approach, one which quickly collects a great deal of information and develops understanding of the local setting. In this approach, multidisciplinary skills (e.g., engineering, anthropology, management sciences and institutional development, and financial/economic analysis) are combined with a development, or change, perspective to create a picture of the actual and desired state related the problem under study. In this approach, the team reads (collectively) large amounts of written material (evaluations, studies, policy documents, business plans, program descriptions). Individual and group interviews are conducted at different levels (community, agency, local government, implementing agent and individual informant).

During this study five communities were visited. Workshops were used to

interact with key individuals (such as the Coordinating Committee) and to test out emerging ideas and working assumptions discovered in the field work. The EHP team interacted with key individuals in three workshop settings during the study period. Interviews were conducted at each TLC with elected councillors and civil society representatives. The team visited government agencies in Nelspruit and Pietersberg, interviewed contractors and individual consultants, and reviewed business plans and engineering studies. During the process, the team met regularly to help each other understand the implications of one disciplinary area for another and to share and verify information from differing perspectives. This final report was written by the entire team. For a list of persons interviewed or contacted, see Appendix A. For a list of materials read, refer to the bibliography.

Community Based Projects Department helped by assembling written information such as studies and legal documents and by organizing the team planning meeting in Hazyview. The Coordinating Committee members served as key informants on local structures and issues and provided valuable feedback as the team gathered information and presented it to them. The engineering investigation was aided by the Operations and Maintenance group in Bushbuckridge working for Rand Water.

## 1.4 Team Composition

The EHP team consisted of four people:

- # Dan Edwards: Team leader.  
Responsible for analysis of organizational and management areas, institutional development project design, and training issues.
- # Jonathan Hodgkin: Engineer.  
Responsible for technical analysis and technical manpower issues.
- # Carolyn McCommon: Anthropologist.  
Responsible for consumer, social, and community analysis.
- # Robert Firestine: Economist.  
Responsible for financial analysis.

The team was assisted by local project staff of the Provisional Bushbuckridge Water Board for organization of appointments and logistical support and for key information. The Rand Water

## **1.5 Report Organization**

Following this introductory chapter, the existing water supply situation in the study area is summarized in Chapter 2. Chapter 3 identifies the key issues that will need to be addressed if transfer of water distribution to local authorities is to be accomplished. (Additional supporting details are provided in Appendices B through E.) Chapter 4 suggests the conditions necessary for TLCs to be able to operate and maintain distribution systems. Indicators for successful operations are presented as well. Chapter 5 describes a typical water service department and the possible administrative arrangements for appropriate roles of major entities such as DWA, BWB, local councils, and water committees. Criteria are suggested for selecting the appropriate options. Chapter 6 presents recommendations for how to move ahead. A suggested transformation program is described, and the conclusions and next steps are presented.

# **2 WATER SUPPLY IN THE PROJECT AREA**

Water supply systems consist of the infrastructure and hardware for water delivery along with the financial, management, and staffing systems necessary to support continued infrastructure maintenance for the long-term benefit of water users. This chapter provides a brief description of current infrastructure and policies and planned improvements for sustainable support.

## **2.1 Overview of the Provisional Bushbuckridge Water Board Service Area**

### **General Information**

As mentioned in Chapter 1, the Provisional Bushbuckridge Water Board (BWB) service area lies within the Lowveld region of northeastern South Africa, within the lower part of the Sabie-Sand catchment area just to the west of Kruger National Forest Reserve. The total service area is roughly 3,300 square kilometers (2,680 km<sup>2</sup> in Bushbuckridge north

of the Sabie River, and 620 km<sup>2</sup> south of the Sabie River). The BWB service area includes Bushbuckridge which falls within Northern Province, and Greater Hazyview and Nsikazi North which fall within Mpumalanga Province. Administratively, Bushbuckridge is divided into three local authorities, currently governed by TLCs. Greater Hazyview now includes the traditionally white area (Ward 1) and five traditionally black communities within the former Kangwane (Ward 2). The remaining communities fall within the White River and Nsikazi Local Authority administered as a Transitional Representative Council (TRC).

### **Demography**

No reliable population figures exist for the service area, but the best available information suggests that about 1,050,000 people live there in some 115 recognized communities. About 80 of this population live in the Bushbuckridge part of the service area, while

**Table 1  
Demographic Information**

<b>Local Authority</b>	<b>Estimated Population</b>	<b>Number of Communities</b>
Bushbuckridge North TLC	258,000	28
Bushbuckridge Midlands TLC	227,000	42
Bushbuckridge South TLC	373,000	25
Greater Hazyview TLC	53,000	5+Hazyview
Nsikazi North TRC	148,000	15
<b>TOTAL</b>	<b>1,059,000</b>	<b>115+Hazyview</b>

Source: Preliminary Report on Bulk Water Supply for the Bushbuckridge area, Strategic Plan, September 1997, AFRICON et al.

the remainder are in the Nsikazi and Greater Hazyview areas south of the Sabie River. (For a complete list of towns, see Appendix B.)

The population figures in Table 1 are rough estimates. Discussions with knowledgeable professionals suggest that they could easily be in error by more than 10%. In some cases, even community names are not standardized, with the old farm names used interchangeably with village names.

### **Background History**

Prior to 1994, the homelands areas of Gazankulu, Lebowa, and Kangwane planned and implemented infrastructure projects (including water supply projects) to serve the areas within their jurisdiction. Gazankulu followed an approach that established water treatment plants and bulk water supply service supplemented by diesel-driven pumpsets on boreholes. The larger water treatment plants at Hoxane, Thulamahashe, and Dwarsloop as well as a number of smaller plants are a legacy of this approach. Lebowa chose to depend more heavily on boreholes to meet potable water needs. Kangwane elected to provide chlorinated bulk water from the Sabie River as the primary water supply.

All of the former homelands depended heavily on the South African consulting engineering and construction companies to plan, design, and build water supply systems and to drill and equip boreholes. Hazyview, a white area, managed its own system with assistance and support of the former provincial and national government.

In 1994, when DWAF took over responsibility for the planning and provision of water supplies from the former homelands (including absorbing former homeland staff), it had no information regarding the existing water supply infrastructure. Although DWAF has managed to assemble a fairly good picture of existing infrastructure and has gained some understanding of its performance, it has not been able to fully define or characterize all system components. Much of the technical information required (including design criteria for some of the water treatment facilities, location of bulk transmission mains, details of community distribution systems, etc.) has still not been assembled because the information has been lost or was not properly documented in the first place or because ad hoc modifications (such as unauthorized connections) have been made.

## 2.2 Existing Water Supply Infrastructure

Existing water supply infrastructure falls into two major categories:

- # bulk water systems, designed to provide water from surface water sources to multiple communities
- # borehole sources, designed to provide water to individual communities or parts of communities.

About 75 of the communities are connected to the bulk water supply network. Its infrastructure includes about a dozen surface water supply sources, water supply treatment plants at most of these sources, a broad interconnected network of pumping and gravity mains throughout the service area, regional storage and service reservoirs, and community reticulation systems. These are shown in Map 1 and described in greater detail in Appendix C. Although the physical network is relatively extensive, provision of water to communities from the network is often unreliable. In some cases, water is never available from bulk sources. This is due to a number of reasons including widespread unauthorized connections, population growth in the service area, inefficient treatment plant operation, and poor system maintenance.

About 25 of the communities within the service area depend solely on boreholes which tap existing groundwater sources. Many other communities, which are served partly or

MAP GOES HERE -- 2 pages odd/even



irregularly from the bulk water supply infrastructure, also depend on borehole water supplies. There are roughly 500 boreholes in the service area of Bushbuckridge, Nsikazi North, and Greater Hazyview. Of these, about 50 are equipped with diesel-driven pumpsets, 5 are equipped with electrical pumps, and most of the remainder are equipped with handpumps. At any one time, a large number of these systems may be out of service due to low borehole yield, lack of fuel, or mechanical breakdown.

## 2.3 Current Water Supply Policy

### National Water Management Policy

The Constitution guarantees every person the right to sufficient water, food, and health care services. It assigns responsibility for provision of infrastructure services, including water supply and sanitation, to local government and spells out that it is the duty of the national and provisional governments to make sure that local governments are effectively performing these functions.

The White Paper on Water Policy, which was approved by Cabinet on 30 April 1997, outlines national water policy objectives and principles. The policy is based on 28 fundamental principles related to water as a public resource, water resource management priorities and approaches, water-related institutions, and provision of services. Among the principles are several with specific relevance to the provision of water supply services:

- # The National Government retains ultimate responsibility for, and

authority over, water resource management.

- # The nation's water resources should be managed to achieve optimum, long-term, environmentally sustainable social and economic benefit for society.
- # Water resources should be managed to ensure that all people have access to sufficient water.
- # Responsibility for the development, apportionment, and management of available water resources shall, where possible and appropriate, be delegated to a catchment or regional level in such a manner as to enable interested parties to participate.
- # Beneficiaries of the water management system shall contribute to the cost of establishment and maintenance on an equitable basis.

### Reconstruction and Development Program

The Reconstruction and Development Program (RDP) emphasizes that growth and development are essential to improvement in the quality of life for the majority of South Africans. Key RDP activities focus on meeting basic needs, developing human resources, building the economy, and democratizing the state and society. Within this context, much of the financing for water supply infrastructure in traditionally disadvantaged areas is channeled through the RDP to DWAF and its implementing agents. Infrastructure development financed by these funds must adhere to RDP policies, guidelines, and standards which state the following:

- # Communities must participate substantively in project development and management.

- # Physical system designs should supply 25 liters per capita per day (l/c/d) at a distance no greater than 200 meters from each household.
- # Training and capacity-building for communities within project areas must be an integral part of project planning and implementation.

### **Department of Water Affairs and Forestry Policy**

National water policies have been interpreted and translated into operational policies and implementation programs by the Department of Water Affairs and Forestry. This process has been guided by the slogan, *Some for all forever*, which sums up the goals of access for everybody to limited resources, on an equitable basis in a sustainable manner, now and in the future. In keeping with the decision for DWAF to become a policy formulation, regulatory, coordination, information collection, and dissemination agency, it has chosen to delegate its operational responsibilities to other agencies and structures. Prominent among DWAF policies and guidelines in this regard are the approved guidelines and procedures for transfer of government water supply systems to other agencies and authorities (DWAF 1997c). DWAF's policy calls for bulk water supply infrastructure to be transferred to organizations such as Water Boards. The policy also calls for transfer of water supply infrastructure to local government, if local government has the capacity to manage and operate it. The principles guiding this process include the following:

- # Users should pay for services received.
- # Assistance should be provided to refurbish infrastructure to an acceptable and functional level.

- # Operating assistance to existing schemes should be phased out over a maximum period of five years.
- # No operating assistance should be provided for new schemes (although the capital costs of new schemes may be provided by government).
- # Major regional schemes should be transferred by the end of 1998, with all government water schemes transferred by the end of the 2001/2002 financial year.

These national policies and guidelines are the driving force behind the water supply activities in the Bushbuckridge, Nsikazi North, and Greater Hazyview areas. As mentioned earlier, the decision has already been taken to establish the Bushbuckridge Water Board to manage bulk water supply for these areas. At present, the service area has been defined and the BWB has been established on a provisional basis. DWAF, project implementing agents, and local government officials are now struggling with the details of how to implement the policy of transfer of assets and responsibility to local authorities within the BWB service area.

## **2.4 Current and Planned Water Supply Improvements**

### **Current Water Supply Service Levels**

The effectiveness of current water supply arrangements within the BWB service area is not well known or understood. Some households have a reliable supply of treated and purified water, but most do not. Many households depend on borehole water sources that are unreliable for a number of reasons. Others are served intermittently by the bulk supply and rely on borehole sources

when bulk service is not available. In some communities where the need is great, water is delivered by truck either regularly or sporadically. Anecdotal evidence suggests that some people continue to get water from nearby dams and hand-dug wells.

It is clear that the water supply systems are largely unreliable for most of the service area population, with continuing heavy reliance on undependable diesel-driven pumpsets. No detailed surveys to define water service levels and usage have been completed. It has been suggested that about 10 to 15 of the population living close to the existing treatment plants can expect reliable water supplies; 30 to 35 obtain adequate water from the bulk system, and the remainder (50 to 60 ) depend in whole or in part on borehole supplies. The extent of the current bulk supply system suggests that 30 to 35 of the present population depend entirely on borehole water supplies. These figures are imprecise, since population figures are only estimates and the reliability of bulk supply at the system extremities is unknown.

Except in the towns of Hazyview, Dwarsloop, Thulamahashe, Shatale, and Mkhuhlu, no formal mechanism for payment for water supply services exists. Efforts are being initiated by NGO-supported projects to establish a fee-for-service system, particularly in some communities with borehole supplies. However, these efforts have only just begun, and it is unclear how successful they will be over the long term.

### **Operation and Maintenance**

Current operation, maintenance, and repair tasks are undertaken by different service organizations in different areas. In Bushbuckridge, a set of seven

maintenance camps perform operation and maintenance tasks associated with the water treatment plants, pump stations, bulk water supply infrastructure, community reticulation systems, and tankered water delivery when necessary. In the Nzikasi North area, a single camp at Malekutu performs these functions. The Malekutu camp also has operation, maintenance, and repair responsibility for other areas as well. The Works Department in Hazyview supports the needs of the communities there.

A Rand Water survey of the maintenance camps in Bushbuckridge (Pelepel and Meulman, n.d.) highlights a number of significant problems related to operation, maintenance, and repair, including the following:

- # inadequate financing for maintenance and repair functions
- # insufficient or poorly located stores of spare parts
- # incomplete sets of equipment and tools for many routine repairs
- # limited trained staff in electrical repair, mechanical maintenance, and pipefitting
- # inadequate transportation and transportation support
- # unclear assignment or division of management responsibilities
- # ineffective mechanisms for staff supervision

These O&M problems are also evident in the Nsikazi North area and, to a lesser extent, in the traditionally black areas of Greater Hazyview. As a consequence, maintenance and repair tasks in much of the BWB service area are not performed in a timely manner, many tasks are beyond the capacity of the maintenance staff and must be contracted to others, and much of the physical infrastructure is now in a deteriorating state.

## **Current Infrastructure Development**

A range of important activities that should make water more available in the BWB service area are underway or planned (the most important of these are being implemented through the DWAF office in Mpumalanga):

- # The Injaka Dam project and first-phase treatment works will initially provide water to Bushbuckridge and adjacent communities.
- # The Marite project will extract water from the Marite River to serve communities in the western part of Bushbuckridge South.
- # The Acornhoek project will construct facilities to upgrade bulk water supply in that area.
- # A construction project to build package treatment plants in the Zoeknag and Dinglydale areas will upgrade bulk water supplies there.
- # A project will upgrade the distribution system in Dwarsloop and improve delivery in the Maviljan area.
- # Roughly 100 boreholes in some 20 communities will be rehabilitated and upgraded in the Bushbuckridge area (managed by DWAF-Northern Province).
- # Projects will construct and/or upgrade reticulation in nine communities in Nsikazi North/Greater Hazyview (DWAF-Mpumalanga and Lowveld and Escarpment District Council).

In addition, several NGOs, principally the Mvula Trust and the Leon Foundation Water Programme, are supporting community-based programs to upgrade and expand services and support the efforts of communities to manage their own water supply service. Some details of these programs can be found in Appendix C.

## **Planned Infrastructure Development**

The DWAF office in Mpumalanga has begun a long-term planning process for the BWB service area. A strategic plan for bulk water supply for the BWB service area (Africon Engineering Internationals 1997a) which outlines the plan for provision of bulk water to every community in the BWB service area has

been prepared. Although detailed feasibility studies for individual projects must be developed prior to implementation, DWAF plans to use this strategic plan as a guide for future development as funds become available. High on the list of proposed projects are expansion of the Injaka treatment works, construction of bulk water pipelines from the Injaka works so that the treated water will be available to users, and water treatment for bulk system service south of the Sabie River. Discussions are currently underway to prioritize other interventions which could be financed under the next round of RDP funding.

Although financing is not yet secured, it appears that the Bushbuckridge area may receive a special allocation to address the immediate need for overall system rehabilitation and refurbishment. Detailed plans have not yet been developed, but it is expected that these funds will be used primarily to refurbish existing treatment plants and booster pump stations. In addition, some funding may be made available as part of South Africa's preparation for drought (based on the strong El Nino event of this year). Should this be the case, some of these funds may be used to extend bulk reticulation to communities not yet served.

# 3

## EQUALISING TRANSFER TO

Water supply system performance is affected by a number of factors which fall into several broad categories – technical, financial, social, and management. This chapter provides a description of the current status and findings related to systems necessary for the sustainable support of a working infrastructure to meet the needs of the communities.

### 3.1 Social and Consumer Context

The ability of local government to develop sustainable systems for water distribution depends in part on the ability and willingness of consumers to pay and on effective water use and conservation at the community level. It may depend as well on the capacity of communities to successfully manage water systems at the local level. Social and consumer factors that may impact the strategies and options for service delivery are discussed below.

#### Social Context for Development

The depressed economy and tradition of nonpayment for water present challenges when cost-recovery is introduced.

The administration of the apartheid years has left behind a fractured social and economic system. These lingering effects

have profound implications on the new government's efforts to overcome the lack of basic services, especially in the area of water supply. Much of the BWB service area is typical of the former homelands, where new communities were established through forced population removals to isolated, often barren areas with rudimentary services. The BWB area today has one of the highest population densities in the country with a range of 146 people per km<sup>2</sup> in former Gazankulu to 303 per km<sup>2</sup> in former Lebowa (Fundile Africa 1996). Although detailed information does not exist, it has been suggested that over half the population do not have access to safe and adequate water supplies.

Opportunities for local employment, even subsistence agriculture, are particularly limited, with most families dependent on male migration for income. Even these sources of income – albeit meager – have become increasingly scarce over the last 10 years as a result of the economic downturn. Staff retrenchments in the mining sector have particularly impacted this area, leaving an already depressed economy even further in crisis. High unemployment is reflected in the high levels of poverty with few people living beyond a marginal status. Indications suggest employment levels within the formal sector are approximately 30-40 (Fundile Africa 1996). The levels of informal sector employment are unclear, but along with pensions do generate some income.

The harsh reality of very low incomes affects the ability of people to pay for improved water service, a factor that is further influenced by their past unwillingness to pay. There is a culture of nonpayment for service as a consequence of the civil service boycotts during the final years of apartheid. People have become accustomed to the provision of free water and, as the team learned in on local discussions, are defiant in their refusal to pay in the future unless there are significant improvements in service. At the same time, the Bantu system of administration for the former homelands led to a dependence on and expectation of government subsidies.

Sensitivity to such issues has left many politicians and local authorities unwilling to push for cost recovery, at least until the current inequities in the system are resolved. Because the current imbalances were due to political decisions, officials feel they must re-establish trust in the political system by providing these long-absent services at government cost. There is a strong will to get organized and ensure delivery on behalf of local communities but a lack of expertise or discipline required to get the job done.

#### Needs, Expectations, and Resources

People's expectations for improved services do not conform to what the government can provide.

The values and objectives of the new government have given rise to high expectations that past inequities in services will be quickly resolved. This is especially true regarding the provision of water where chronic and severe shortages have left much of the population in the

greater Bushbuckridge area without access to adequate, safe water supplies. Most people anticipate that the construction of the new Injaka Dam and the completion of the other RDP infrastructure projects will satisfy the local demand for water and eliminate the problems of limited supplies. They also assume that service will be improved to the level of having treated and purified water delivered through household connections.

Reality suggests otherwise. Given the government's budgetary and resource constraints, the national policy means that any service provided by government will be to RDP standards and, therefore, will likely not meet community expectations of higher service levels. RDP policies call for standpipe connections within 200 meters of households, a standard far below the anticipated level of household connections with treated, purified water. Many people, however, assume that the national government has sufficient funds to meet both their needs and wants. They seem to believe that their preferences will be met if their requirements are fully understood and communicated by those in local government to those in higher positions of authority.

#### Misguided Intentions of Local Authorities and DWAF

Funds are not available, and community involvement is inadequate.

Clearly, the level of service necessary, desired, and expected does not conform to what is available or affordable. This creates a potentially difficult situation in reconciling people's hopes with facts. The situation is further complicated by an

apparent lack of information or misunderstandings on the part of many local authorities. Many officials have themselves raised local expectations that there are funds somewhere within the government, other donors, or NGOs to fill the gap if only the right petitions or proposals are made. Conversations with local authorities indicate a disturbing presumption that subsidies or grants will be provided to sustain or expand levels of services. The imperative to introduce cost-recovery is seen only as a plan for the future, not as a necessary strategy for meeting current needs. This hesitation in even considering the issue of self-financing overlooks the potential for cost-recovery that has been achieved by Mvula Trust in its recent community initiatives.

Local authorities are not alone in their limited approach to resolving problems of water shortages. DWAF and its implementing agents act as if they have taken a narrow interpretation of the potential for community involvement in assigning its priorities for local project selection. There have been few candid discussions at the local level on either the disparity between resources and needs or the uncertainty of funding for the entire master plan for water services development with implementation phased over 15 years (and yet to be fully funded). Up until now, DWAF has followed a technically driven policy that has left little opportunity to engage the community in the early planning stages, where their needs and interests might be more effectively engaged. Thus communities continue to believe that ongoing projects will very quickly alleviate the problems of water supply. As a result, little thought has been given to meeting the more urgent needs of villages not included in the first phases of infrastructure development. Some efforts have been made to engage Mvula Trust in

supporting such villages, but DWAF's ad hoc approach to community identification has been a limiting factor. Similarly, the failure of DWAF and its implementing agents to consult with communities at an earlier stage in project design stifles local ownership and, over the long term, will affect the extent to which communities feel responsible for operation, maintenance, and cost-recovery.

## Water and Health

The health implications of poor water supplies cannot be overlooked.

The shortage of water is serious. While the lack of adequate data makes it difficult to be precise, it was clear from local visits and discussions that few people are getting even the minimum amount of water recommended for safe health. The World Health Organization recommends 50 l/c/d,<sup>4</sup> and RDP standards call for a minimum of 25 l/c/d. Actual usage is reported to be below this figure, ranging to lows of 10 l/c/d in poorly served areas. Fetching water is time-consuming. Women, with some assistance from their children, are the primary collectors of water and walk up to 6 km or more each way. In addition to the time spent walking, they may wait for many hours.

Access is limited and unreliable. While some households have a reliable supply of treated and purified water, most do not. The majority use communal

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<sup>4</sup> WHO's Basic Water Requirements for Fundamental Health Needs suggest drinking water requirements of 5 l/c/d, sanitation requirements of 20 l/c/d, food preparation requirements of 10 l/c/d, and bathing requirements of 15 l/c/d.

standpipes with inter-mittent supply from the bulk system or bore-hole sources. Some depend on small tankstands filled with water transported by DWAF, and others depend on hand-dug wells or nearby dams where possible. As a last resort, some people hire a vehicle and travel to other villages to fetch water. Overall coverage is not well known, although available figures (see Section 2.4) suggest that less than half of the population obtains adequate water from either the existing treatment plants or the bulk system. The situation is far more unpredictable in areas dependent on boreholes where pumps are frequently idle due to lack of spare parts, diesel fuel, or basic maintenance, with a large number reported broken down and out of service.

Water flow is intermittent and often unpredictable, a situation related to the prevalence of unauthorized connections that have disrupted normal distribution. Frequently, women find it necessary to walk from one standpipe to another in search of one with running water. At other times, they may sit by a dry connection in anticipation that the water may start flowing in a short time. As often, they may be forced to wait to fetch water until the early hours of the morning when users at a lower point of distribution have turned off their taps, allowing pressure and flow to build up for communities further along the line.

The shortage of water is confounded by dripping faucets and leaking pipes (especially those around unauthorized connections) resulting in pools of water collecting around water points. Observations showed trash and insects floating in stagnant water with children playing nearby. As a further consequence of supply problems, water may be poorly stored. To ensure sufficient water, women collect water in large plastic

buckets and jerry cans, most of which are initially covered but may remain open within the house. Usually drinking water is set aside in a separate container, but often, as a matter of course, the container used for storing household water may be used at another time for storing drinking water. Sources for contamination are numerous.

The implications for health are obvious. Many people appear to be aware of the relationship between environment and disease but are unsure what can be done to mitigate problems. They stressed their desire for purified and clean water in describing their use of bleach to purify locally collected water. People reported enteric diseases, such as cholera and persistent diarrhea among children—diseases associated with contaminated water. Incidences of malaria and typhoid (even a few deaths) have been steadily increasing. People complain about insufficient water to bathe, citing dry skin and skin-related diseases. Dirty dishes are often left sitting for days, attracting cockroaches and flies.

#### **Absence of Ownership or a Sense of Responsibility**

The culture of dependency must be changed; people need to feel empowered to take responsibility.

The top-down approach of the apartheid government in the rural areas instilled the role of government as provider and that of communities as recipients or passive beneficiaries to whom services were given. Little, if any, emphasis was placed on instilling a sense of local capacity at any level, giving rise to dependency that today is almost ingrained. As a consequence, there is an

absence of ownership or sense of responsibility toward maintaining facilities, even to the extent of simple clean-up campaigns. In local discussions, many users, local committees, and newly elected officials expressed feelings of hopelessness in resolving problems, their comments indicating a continued reliance on others to solve problems. Complaints were made about boreholes shut down for lack of diesel, but few people saw any role for the community in collecting funds and organizing such purchases.

Instead, individuals pointed to DWAF as the guilty party and seemed not to take action, even in cases where it was apparent that DWAF was not going to respond as quickly as necessary. There appears to be a pervasive wait-and-see attitude when systems break down, coupled with reluctance to take on responsibility for solutions, even for minor problems. Some communities have been successful in mobilizing support and funds to correct problems, with a few going as far as to seek support from NGOs such as Mvula Trust and the Leon Foundation in resolving their problems. More often, a sense of ownership seems lacking.

This absence of ownership is reflected in general apathy toward checking vandalism or controlling unauthorized connections. It is also seen in the extent to which individuals apparently feel justified in such behaviors. Vandalism of street pipes and engine theft have continued, long after the transition to representative government and the need for civil protests has ended. Unauthorized connections began to appear soon after water systems were completed. The problem has persisted and, based on local comments, even increased under the new government. Such connections were frequently cited as a problem requiring

control, but only on the part of others. Even local authorities applaud the initiative of citizens in upgrading their services through such connections, while acknowledging that such connections may create and exacerbate inequities of access.

### Defining New Roles and Structures

The transition to new structures is complicated by a lack of clearly defined roles and responsibilities among elected officials, civil society, and traditional leaders.

As a consequence of the current transition, a complex network of relationships has been created, and local roles in information-sharing, decision-making, and implementation are unclear. To some extent, difficulty in defining new roles and structures is inevitable in this period of rapid transformation to representative government. Structures associated with the former administration, such as the tribal authorities, are frequently dismissed by those formed under the new democratic structure, such as the Transitional Local Council (TLC) and Local Reconstruction and Development Committee (LRDC). Within the new guard, competition has emerged yet again between those representing elected government (the TLCs) and those representing civil society (the LRDC), with each claiming to be the true voice of the people. The result is a variety of structures that, depending on the area and individuals involved, may be relevant for water services development and need to be consulted or involved at various points.

The complexity emerges at two levels related to community-based development.

The first concerns the existence of local water committees. It is not clear within any of the regions how many water committees exist and in what capacity. Some existing committees derive from the old homeland structure and have an ambiguous status. Some were established under direction from DWAF. Recently, new water committees have been formed and trained by Mvula Trust and the Leon Foundation to manage newly installed systems. Still other Project Steering Committees (PSCs) have been formed by engineering firm implementing agents under DWAF-related activities, although these PSCs have a limited project-specific duration. In other instances, all-purpose water committees have been formed by Community Reconstruction and Development Committees (CRDCs). In some areas, there may be no viable water committee structure. In their absence, individual members of the CRDC, the Ward Councillor, or even tribal authorities may assume responsibility for water issues. They also may not.

The second level of complexity regards the liaison between the LRDCs and the TLCs. As a consequence of political jostling, awkward and sometimes strained relationships have emerged between the two. The competition appears to stem in part from political ambitions. Many of the new councillors were elected from RDC positions where they were active in development. According to observers, some elected officials have claimed development as their jurisdiction and bypass the LRDC to work directly with the ward councillor and the Ward Reconstruction and Development Committee (WRDC). In some communities, it appears as if RDCs were hijacked by those who lost and are using them now as a platform for the next election. In some areas, there is much

jealousy between the two, especially since the councillors receive a salary and cellphone use and have access to transport. These issues are magnified when there is a project and prospect of funding.<sup>5</sup>

As a consequence of confounding institutional roles, clear mechanisms and channels for user feedback regarding water supply exist in some communities but not all. Inconsistent links between water committees and the ward level structures (the ward councillor and the WRDC) and the regional structures (the LRDC and TLCs) complicate the provision of services. It also impacts the work of the private sector and DWAF with communities. According to DWAF and consultant engineers, the difficulty navigating overlapping relationships has affected their promotion of community involvement. Problems cited include the lack of continuity in community-based structures and resistance from some TLC officials in empowering PSCs.

### **Variable Approaches to Community Involvement**

**Institutional approaches to community involvement vary, affecting the extent to which local capacity and empowerment are built and achieved.**

**RDP and DWAF policies call for community-based development in the provision of improved water supplies. The objective is for communities to be**

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<sup>5</sup> Because of such bickering among TLCs and LRDCs, the RDP sponsored a workshop this past August to relaunch the concept of a partnership between civil society and elected government. Unfortunately, as a consequence of the then ongoing political unrest, the Bushbuckridge TLCs were not included.

genuinely involved and to build local capacity for ongoing operations and maintenance with full responsibility and accountability being taken at the local level. The difficulty in realizing these aims is caused by the varied approaches to project implementation by those agencies and groups involved at the community level. This affects the extent to which capacity is in fact built and communities empowered to assume management roles. The content and quality of such capacity-building varies greatly from community to community, depending on the implementing agency involved.

The problem is particularly evident among the engineering firms and consultants contracted by DWAF to support the development of PSCs for RDP-financed water projects. Even though these firms are required to provide capacity-building within their project plans, training is often limited to short interventions in the beginning. Interviews suggest that this amount of training does not provide the skill-building necessary for ensuring sustainable management. Further it appears that, in some instances, training is not provided at levels promised and may even be eliminated completely. Thus in these instances, capacity may not be built and local structures undermined by inappropriate or misguided interventions. The new Build-Operate-Train-Transfer (BOTT) contract is intended to overcome some of these weaknesses.

Both DWAF and RDP have structures in place intended to monitor and ensure that such guidelines are followed, but neither organization has been as effective in this regard as desired. Within DWAF, the Community Development Officer (CDO) is intended to provide support to the community in the initial organization of the PSC, assessment of training needs,

and monitoring of externally provided training. However, the CDOs have neither the experience, capacity, nor mandate to be as effective as necessary. (There is only one CDO responsible for the BWB service area at the present time). For its part, the RDP has three subdirectorates with the mandate to review planning, monitor project implementation, and provide community liaison. However, a shortage of resources has made it difficult for these staff to follow through at the community level and to ensure the capacity-building envisioned.

The narrow approaches taken by most engineering firms contrasts sharply with that of the two NGOs, the Mvula Trust and the Leon Foundation Water Programme. Both emphasize and try to ensure broad-based capacity-building. The emphasis these organizations place on substantive involvement at all levels has apparently led to more comprehensive capacity-building, including all levels of management, technical skills in operation and maintenance, and community awareness.

### **3.2 Technical Performance**

Technical findings fall into several broad categories relating to service levels, infrastructure condition, operation and maintenance, plans for development, and transition issues.

#### **Current Service Levels**

Most communities do not have reliable water supply service. Population growth, deteriorating equipment performance, poor operation and maintenance practices, and unauthorized connections to both the bulk system and to community reticulation all contribute to poor bulk water service. Also, south of

the Sabie River, bulk water is not properly treated, although it is chlorinated. Water supply is reliable for a small percent of the population living in proximity to water treatment plants. It does not appear that the Bushbuckridge Water Board in its current provisional status, or once formally constituted, will be able to provide reliable service to most communities in the near term. This will clearly have an impact on the willingness of people to pay for water.

Water supply for most of the BWB service area was designed to provide public standpost supply. Widespread unauthorized connections to the bulk infrastructure system and to community distribution systems has a significant impact on overall system performance. Most of the population appear to want individual service provided in the yard or in their houses. Water usage varies with the level of service provided; households connected to the system use three to five times more water than households obtaining water from standposts. In many areas, particularly near treatment plants, unauthorized household connections have proliferated, which reduces the amount of water available for users further along the pipeline network and contributes directly to the unreliability of the supply.

Borehole water supplies are also unreliable; in many areas groundwater resources are limited, and operation and maintenance (O&M) support is not adequate. In areas of limited groundwater resources, low-yield boreholes must be equipped to provide at least some water. These are often overequipped and therefore overpump the aquifer; at the same time, they require more extensive maintenance. Communications problems and lack of adequate transportation hinder efforts to provide fuel and maintenance support to borehole

systems. Lack of adequately skilled maintenance and repair staff compound efforts to keep borehole water supply systems in proper operating order.

### **Infrastructure Condition**

Incomplete information about the bulk water system, community distribution systems, and borehole water supplies create another impediment to planning for system development and transfer of authority to the Water Board and local authorities. To date, a full inventory of the water supply infrastructure in the BWB service area has not been completed. Although the general layout and many details of bulk water supply infrastructure are known, information regarding many of the community-level distribution systems is not well documented. This lack of information hinders the process of problem-solving and improving service delivery. It also hampers the technical analysis necessary to prioritize, specify, and estimate costs for system rehabilitation and expansion. Without a full inventory, it will be difficult to transfer assets properly to the BWB or to local authorities.

The poor condition of the overall water supply system will complicate transfer of assets and responsibility to the Water Board and local authorities. Even a cursory examination of much of the water supply infrastructure reveals significant deficiencies. Bulk meters are not fitted at treatment plants, treatment plant equipment is not properly serviced, pipelines leak, valves are broken or in poor condition, unauthorized connections are poorly executed, and borehole equipment is often out of service. A survey conducted by Fundile Africa (1996) indicates that 105 of 115 communities surveyed (or 91 %) had infrastructure problems ranging from

vandalized standposts and insufficient water storage to leaking pipes and unauthorized connections. Although DWAF is committed to rehabilitation and upgrade, adequate funding remains a problem. The BWB and local authorities will likely have to accept assets which are not in good condition.

### **Operation and Maintenance**

Current operation, maintenance, and repair programs and practices are not sufficient to maintain the water supply infrastructure to acceptable standards. Although DWAF and others are responding to immediate O&M needs as they understand them and work is continuing as budgets allow, maintenance and repair programs are not able to keep up with the required pace. Issues related to management of staff, budget allocations, and inadequate facilities cause significant problems. Poorly trained staff and lack of adequate transportation, communication, and spares are also contributing factors to infrastructure deterioration. Current maintenance and repair activities are conducted in response to problems in a crisis mode, with no attention paid to preventive maintenance.

### **Planning for Development**

Local authorities, who will ultimately be responsible for water supply provision, are not adequately involved in the planning process. Responsibility for water system planning and development is largely in the hands of DWAF and the consulting community. Although most local authorities would likely agree with the goal of providing bulk water to every community, the government's decision to fund programs to provide service only to the RDP standard (25 l/c/d from public

standposts) is not likely to be well received. Currently much of the priority work and decision-making for project design and development is defined by technical and cost considerations as determined by DWAF, and not by social, political, or O&M cost considerations. To date, it does not appear that local authorities, who might be able to contribute to this decision-making process, have participated meaningfully in long-term planning or project priority-setting exercises.

Infrastructure development plans do not appear to address community desires for household connections. If local authorities eventually have management control of community distribution systems and allow or even encourage household connections, the planned bulk supply network, as currently envisioned, is not likely to provide the volume and flow rates necessary to support water usage levels. It will be important to plan for system upgrading and expansion in the future to allow for such connections. It will also be important to control unauthorized connections, which generate no revenue, and to encourage water conservation through education and appropriate tariffs.

Given the current condition of the water supply infrastructure, the capacity and budgets for maintenance and repair, and the likely budgets for capital improvements, it is clear that the goal of bulk water supply provision, even at RDP standards, is many years away. For the foreseeable future, many areas will have to depend on existing borehole sources and will not have a reliable piped water distribution system.

### **Transition and Turnover of Assets and Responsibilities**

With the possible exception of Hazyview, personnel in the local authorities do not have an understanding of the technical issues related to water supply provision. The fundamentals of the hydrologic cycle, treatment plant capacities, well yields and pumping rates, water consumption levels, the impacts of unauthorized connections and system leakage, and the technical requirements and costs for maintenance and repair of system components are not well understood. This deficiency puts local authorities at a distinct disadvantage in any discussions related to water system technical matters.

In addition, local authorities do not have the technical capacity to manage water infrastructure. They do not currently have workshops, offices, materials or equipment, transportation, communications capability, or staff. Even if DWAF operation and maintenance staff are seconded to local authorities along with the available but limited materials and equipment, these local authorities appear to lack the skills and experience necessary to assess problems, decide on solutions, or direct the work of the seconded staff.

### **3.3 The Financial Situation**

DWAF currently operates, maintains, and repairs all water-related infrastructure, but it does not have the capacity to collect revenues from system users. Local authorities do have the right to assess user charges and will need to do so when assets and responsibilities are transferred to them. This section highlights issues related to finance and revenue generation.

#### **Financial Factors Affecting the Transfer to Local Authorities**

Except in a few areas within the BWB service area, user fees are not currently collected. To assure the continued, successful provision of water service to all households and businesses in the area, adequate revenues must be generated. If the revenue from all sources does not meet long-term spending requirements, maintenance will drop off, resulting in inadequate service. Increased breakdowns will eventually mean that at least part of the system will cease to function. Thus, continuity of future water service depends upon adequate revenues.

Equitable distribution of water to all communities in the area depends upon water conservation. Even the planned water treatment and distribution system may be hard pressed to meet the RDP standard of 25 l/c/d throughout the area. Water usage well beyond that level estimated here at 100 l/c/d may be expected from the growing number of households that, in coming years, will enjoy household or yard connections. Moreover, widespread unauthorized connections as well as general system leakages will absorb sizable fractions of the total output. Water that is lost through leakage and unauthorized connections is considered unaccounted-for water (UFW) and does not generate revenue. General water conservation is essential, therefore, especially for water to reach sites far away from treatment and supply points.

Fair pricing and accurate billing of water are needed to assure widespread popular support for a self-sustaining local water service. In general, people are willing to pay for good-quality water service that is fairly priced, with billing based on the quantity of water consumed.

## Revenue Collection

Most persons interviewed in local authorities and community organizations expressed a strong preference for household or yard connections. Moreover, nearly as many respondents indicated that people are willing to pay for clean water, reliably delivered (presumably approximating 24-hour water availability) to such connections. But a history of free water may make the establishment of fees difficult. The few towns that now have metered water service impose only token tariffs, well below cost-recovery levels. With the clear exception of Hazyview, local residents and businesses will likely be unprepared for the level of charges required to achieve financially self-sustaining operations.

With two exceptions, there is no meaningful formal fee system for water service or revenue-generating activity anywhere in the BWB service area. (In a few communities, ad hoc revenue collection reportedly occurs to buy additional fuel for community borehole pumps.) The exceptions are in Hazyview (Ward 1), which has its own locally determined government administration, and four towns Dwarsloop, Shatale, Thulamahashe, and Mkhuhlu each of which enjoys the services and facilities of a Province-appointed town manager. Hazyview (Ward 1) and the four towns have metered connections for most of their residential and business customers. In Hazyview, monthly service charges of R30.00, plus significant usage tariffs of R1.40 per kl under normal conditions and upwards of R1.62 under water restrictions, contribute to expenditures in the small-community fiscal environment. In Dwarsloop and Mkhuhlu, and probably in the other two towns, identical charge schedules for metered water have been imposed by the Northern Provincial government. These schedules include

both flat-rate monthly service charges (R7 per month for residences and R10.75 per month for businesses) and block-rate usage tariffs (R0.20 per kl for the initial 50 kl of water, plus R0.30 per kl thereafter, less 2 kl). The fairly small revenues that are collected from these rather modest charge schedules are remitted directly into the bank account of the Province.

### **Cost Recovery**

Successful cost recovery in water service provision depends upon identification of all costs that must be financed for the utility to become self-sustaining. In addition to costs of personnel and obvious items such as equipment, energy, etc., there are costs that are important for future operations but which are not visible to local authorities. The wholesale purchase of bulk water is one such cost, which heretofore has been provided free of charge. Other costs, such as rehabilitation of existing facilities and capital expansion of future facilities, have also previously been borne by a higher level of government. Moreover, a careful accounting of the actual O&M requirements of a given water service organization would likely uncover numerous staff requirements that local authorities might not envision in the first instance.

### **Financial Planning and Priority-Setting**

Since local councillors generally have little or no experience with water service operations, they are not prepared to manage and operate water service organizations. In the project area, except Hazyview, all formal expenditures for water treatment and distribution are undertaken by DWAF and financed by government. Many DWAF employees

would presumably be seconded to Local Authorities, perhaps for a significant period of time, to facilitate the transfer of water service responsibility to local authorities. Their expertise will be essential in management and administration as well as operations and maintenance, even though their skills are limited. In other areas, however, even the existing DWAF personnel may be of limited assistance to local leaders. For example, neither DWAF nor any local personnel have appropriate experience in financial decision making on such issues as tariff-setting or revenue collection. Even the establishment of expenditure priorities among types and locations of projects will require a combination of technical knowledge and community understanding that may go beyond the experience of any available personnel.

### **Unauthorized Connections**

Unauthorized connections are widespread, although no one knows the full extent of the problem. Such connections are so easily made that even a concerted effort to eliminate them, absent a more comprehensive approach, might well fail. Unless unauthorized connections are significantly reduced in number, they will likely make a mockery of any meter-based user charge mechanism, undermining any attempts at cost-recovery.

## **3.4 Institutional Structures**

A number of institutional actors are involved in the water sector and will affect the process of setting up a program for local government to take over distribution systems. There are three essential levels to consider: the governmental agencies operating at

national and provincial levels; the local government units (TLCs/TRCs), and the community and civil society level (water committees and the LRDC structure). For fuller descriptions of DWAF, local government, and civil society structures and the policies relating to provision of water services, see Appendix D.

### **Responsibility for Supervision of Operations and Maintenance**

The division of responsibilities within the Department of Water Affairs and Forestry has changed frequently; this appears to confuse local officials, contractors, and DWAF staff. Until April 1997, the DWAF Northern Province (DWAF/NP) managed the operations and maintenance of schemes in the Bushbuckridge area, while DWAF Mpumalanga (DWAF/M) managed planning and infrastructure investments. DWAF/M also has responsibility for all aspects of water supply for the Nsikazi North and Hazyview areas. In April 1997, O&M responsibilities for the Bushbuckridge area were transferred to the DWAF/M, but monitoring of staff time sheets and administrative responsibility for staff still remains the responsibility of DWAF/NP (managed from its district office in Giyani). It is not clear who has responsibility for the O&M budget for consumables, spares, vehicles, fuel, etc. DWAF/NP continues to plan for infrastructure development in the region, especially borehole drilling and refurbishment.

DWAF/M has named Rand Water to be its implementing agent for O&M in Bushbuckridge for a two-year period until the BWB is properly established. At the time of this study, Rand Water's business plan for O&M had not been approved. Presumably the Rand Water O&M contract will require the supervision of DWAF/NP O&M staff; these staff,

however, have not yet been formally assigned to work with Rand Water and are unsure who they report to. Those interviewed indicated that supervision is unclear (refer to the management section below). Staff are waiting to be seconded to the BWB and local authorities and appear to have little supervision at present. They are described by several TLC councillors as idling.

### **Strategy for Turnover of Systems**

While DWAF's policy is to turn over responsibility to local government for water services, it is not clear to anyone how long this process will take or the specific mechanisms that will be used to complete it. For infrastructure within former homeland areas, it is DWAF's policy to turn over this infrastructure to local authorities as soon as feasible within the next five years, depending upon demonstrated competency. Where capacity and competency already exist (established local government authority with budgets and staff prior to the last elections), full ownership can be transferred immediately (DWAF 1997c). It is not at all clear when or how capacity and competency will be established in the Bushbuckridge area so that transfer can take place. Nor is it clear how or when local authorities will actually take responsibility for water system management.

Local government officials are unclear about how the secondment process for staff transfer to local government will work or about their rights of refusal. It is government policy for DWAF to transfer staff that it inherited from homelands administrations or the prior government arrangements to either local government or second-tier organizations, such as Water Boards, under secondment arrangements. It is not clear how long

DWAF must continue to pay for seconded staff or when water organizations must absorb salary and benefits. Transfers must be viable and sustainable and no interruptions of service at any stage during the transfer process must occur (Fundile Africa 1996). Local government units are not required to receive all staff, however; seconded staff must be qualified for the positions available, and acceptance requires agreement on both sides. If local government units do not have positions open, they cannot be forced to receive seconded staff. Presumably, the government will be responsible for the staff who do not find appropriate placement within the local authority or BWB.

A related issue is the capacity of the local authority to cover staff salaries and the ranking process for classification of these units of government. All local authorities are ranked, from 1 to 15, based upon population and performance. For example Johannesburg and Pretoria would be graded 15. This allows them to compensate staff at the highest levels. Local authorities in the Bushbuckridge area range from 1 or 2 to possibly 5. With lower pay scales, it will be difficult for these TLCs to attract the qualified staff they need to manage and maintain water service organizations.

Resources for transfer have not been provided to local governmental structures, and the prospects for income generation are weak. Very little budget is currently managed by local government units, and their capacity for revenue generation is extremely limited. Budgets for TLCs are provided by central and provincial authorities through the District Council. As civil society structures, LRDCs do not get even this limited support. If local government is to take over management for any infrastructure or service, it will need sources of funding

and the ability to identify costs and budget for expenditure. Income generated from water users will need to be earmarked for water service provision.

Land titling issues complicate the potential for viable TLCs in the project area. Under the old homelands system, tribal authorities (e.g., there are five chiefs in the Bushbuckridge area) were given the land to be held in trust as collective property of the people. Chiefs were allowed to apportion it for citizen use (i.e., people could live on land with the permission of the tribal chief or the appointed authority, the *induna*). Individuals living within former homelands do not currently hold title to land, and local governmental structures do not yet have the legal capacity to collect land or property taxes (called seizure rights) unless title is held. There is conflict between the newly developing TLCs and tribal authorities over who has the right to collect taxes. It is believed that with the reconstruction process, all laws governing tribal authority were repealed or absorbed within the new constitution, and chiefs were given allowances in compensation. A council of chiefs is currently meeting with the government to work out ways to deal with traditional authorities and their rights.

### **Differing Perceptions about Governance Authority**

The jurisdictional status of Bushbuckridge as a part of the Northern Province continues to create confusion. Interviews in the Northern Province District Council and the Ministry of Local Government and Traditional Affairs indicate that until a final disposition is made assigning political affiliation for the residents of Bushbuckridge to Northern Province or Mpumalanga, planning and financing

projects for the region will be minimal. The Provincial Council in Mpumalanga is reluctant to initiate programs and commit resources while there is uncertainty about the future. Local people continue to be unhappy about the lack of government investment in the area, and according to rumors, a resurgence of public protest is likely before the end of the year.

The TLC and the LRDC often vie for power over decision making. Interviews at local levels indicate that in some areas, LRDC representatives resent the more recently established TLC councillors, who receive support and allowances from government. LRDC representatives currently work as volunteers without government support. As a result of the proportional election process, many of the councillors were appointed to TLC positions, while other possibly deserving individuals were overlooked. TLC councillors now have administrative areas of responsibility (for example, as water councillor) and believe that they are empowered to make decisions. Some LRDC representatives believe that they themselves continue to represent the will of the people and should be taken seriously by the TLC councillors. As the water service organizations begin to be structured, linkages from the community via water committees (which also involve village, ward, and LRDC members) need to be taken into account.

### **3.5 System Management**

As mentioned earlier, local authorities within the project area (with the exception of the Hazyview town area) do not currently manage provision of water service. In order to build these services at the local level, the current obstacles need to be addressed as part of a transformation program to build water

management capacity. The issues identified here have implications for provision of water services by any local management system in the future.

### **Communication Processes**

Communication processes among TLCs, RDCs, and communities appears confusing. Communication among consultants, the TLC, and civil structures is also often misunderstood. Messages communicated from information sources are often unclear or partially understood. The chain of information to and from community members, local authorities, project implementing agents, and government structures often distorts messages so that they are not communicated as intended. In most instances, the DWAF project implementing agents lack the skills for managing communication and community involvement. Whether consulting with representative bodies, such as the project steering committees, TLCs, LRDC structures, or water committees, they often do not communicate clearly. They are not able to communicate ideas and issues in a manner that local participants understand and sometimes seem to believe that telling people information once is sufficient for information-sharing. Even when local needs are listened to and acted upon, the follow-up process of communicating back to those particular communities and people is often skipped, so people do not know that their views are indeed being considered.

### **Decision Making**

It is not clear who decides about the application and enforcement of RDP standards for community participation, training, and capacity-building in RDP-

funded water supply projects. Although DWAF requires these elements prior to approval of project business plans, no one appears to be effectively monitoring and enforcing either the spirit or the letter of them. DWAF, the consultant, the PSC, the TLC, the CRDC, and community leaders may all have a role, but a clear mandate to monitor, report on, and enforce these implementation measures appears lacking.

Water system planning, development, and management processes are unclear. Currently DWAF, in consultation with relevant consulting engineers, appears to plan and set priorities for water system development. Management of current infrastructure is nominally done through the Interim Operating Committee, but the process of day-to-day decision-making is confused. DWAF, TLCs, the RDC, District Councils, and communities all believe they should have a role in all decisions, and some make decisions without necessarily consulting together. It is difficult to set priorities when full consultation does not happen and communication processes are confused.

### **Planning and Structuring**

Currently the Institutional Development Project (IDP) seems to have no clear leadership. A clear vision is needed about where to go and how to get there. The strategic plan that was developed by a provisional coordinating committee in May 1997 at the Wits Rural Facility seems to have been forgotten; TLC and RDC members are unfamiliar with it. As key people have changed in the mix of the IDP coordinating committee, new members have not been informed of the history of decisions. There appears to be a lack of informed consensus about where to go or how to get there to transform responsibility from DWAF to local

administration of water supply. Leadership in water management in general and within the local authorities specifically needs to be strengthened.

Most of those interviewed in local authorities were unclear about how the administration of the water distribution system should be set up and what kind of O&M structure should be put into place. Because tariffs are rarely collected, there is also little experience with the finance and administration of O&M in the TLCs. Hazyview (Ward 1) and portions of townships where meters are installed have some experience in this area. There seems to be an implicit assumption that each TLC will set up a water department similar to those in towns in the rest of South Africa. However, such local departments do not usually have extensive rural and peri-urban populations to serve and do not need to conduct health education and extensive public awareness campaigns. They also do not usually have to overcome a history of free provision of water.

A development strategy needs to be created to meet water service needs of the people; local authorities do not have the information necessary to develop such a strategy. Meeting needs for water supply using the large bulk schemes will not be realistic for many years to come. Thus, a short-to-medium-term strategy is called for. The TLCs do not seem to understand this phased planning. Any future capacity-building for transition will require training for local authorities in strategic thinking and planning. They will also need engineering advice that they can trust so they can effectively advocate for the needs of their people with the future bulk supply operator (BWB) and DWAF.

Roles and responsibilities for management, planning, and decision making at all levels are not well understood or communicated to others.

DWAF planners, contractors, Provisional BWB staff, and O&M personnel make decisions that TLC councillors now believe are theirs to make. Effective supervision of DWAF O&M staff seems to be lacking; it is unclear who they work for now or will work for in the future. The LRDC structure, as civil society representatives, may also have a role, but in some areas, the LRDC finds itself struggling with the TLC to assert its voice.

### **Support for Human Resources Development: Capacities and Skills for Management**

The issue of capacity-building for O&M staff now working for DWAF is often ignored. Many TLC members assume that staff seconded from DWAF will be able to perform O&M and repair tasks effectively once activities are directed by local authorities. This may not be the case, as the technical skills of this cadre are limited and many are functionally illiterate. In addition, if systems are to operate efficiently in the future, revenues must be generated and managed. Business skills related to billing and collection, budgeting, and accounting will be needed at various levels. Management and commercial skills and knowledge will be needed at the local authority and community water committee levels where some management functions could potentially take place.

During interviews for this study, the team met up with expressions of negativity, anger,

and blaming of others for poor water system performance, project planning and development, and ineffective communication. Those interviewed often expressed frustration at working in a system where they needed to manage with insufficient information and understanding, while suffering from continual complaints on all sides and a general lack of support. At the local level there appeared to be a lack of trust in others and a lack of self-confidence to manage complicated tasks. In some cases, political squabbles among various groups and factions reinforce these problems. A management approach should be developed that supports risk-taking and learning in the process of development. There is a great need for a more positive approach to management of the water distribution system.

# 4 CONDITIONS FOR TRANSFER OF WATER

As previously noted, DWAf policy is to hand over regional bulk water supply schemes to duly constituted Water Boards and to hand over operation and maintenance of community distribution systems, borehole schemes, and possibly other water supply and sanitation infrastructure to local authorities. For local authorities to accept ownership, O&M, and repair responsibility, a range of decisions must be made and conditions met to ensure sustainable financial and technical system operations. This chapter discusses the management, financial, technical/engineering, social and consumer, and human resource development requirements for transition of water supply responsibilities to local government

## 4.1 Management Requirements

### Building from the Present

The discussion of management issues in Chapter 3 clearly indicates that an organizational structure to meet consumer needs for water service does not exist at present. While operators, pipe fitters, distribution networks, and boreholes can be transferred, there is little management capacity to transfer to local government. A rational structure must be built, using the current equipment, staff, and experience as a starting point. In Chapter 5 the beginning framework of a water service organization structure for local

distribution is outlined, and the pros and cons of various institutional arrangements for management are described. If the new water service organization<sup>6</sup> is to be successful, a number of essential conditions will need to be met.

### Autonomy in Operations

The water service organization (WSO) will need to be able to do its day-by-day O&M job free of interference from politicians and local government employees outside of the organization. The water manager must be allowed to manage, discipline, and reward staff to meet performance goals. The organization must be able to create and manage its own budget. Its accounts must be separate from other local government accounts, and the manager must be able to authorize payments. Formal auditing of accounts should be performed by independent counsel, according to regulations. Tariffs must be set by agreement with local authorities at rates adequate to meet operational costs.

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<sup>6</sup> The authors have purposely not indicated whether the water organization should be called a water department, a local government-owned-and-operated water supply company, or a water services contract. The selection of options must be made by local authorities. The text uses the term, water service organization, which could apply to any of these management designs.

## **Management Processes**

Effective management of a WSO includes maximizing the performance of all employees. Staff should work together as a team. Managers and supervisors will need to have the skills to communicate well, to run meetings in an orderly manner, to assign work clearly, and to provide feedback on staff performance. The water service manager should know how to delegate tasks to supervisors, who are in turn authorized to make decisions to get the job done without waiting for approval. The management team should define key performance indicators, such as water loss, income and expenditure, budgets, billing and collection rates, and efficiencies in operating pumps and equipment. Once indicators are defined, they should be regularly monitored. Management systems will need to be developed and put in place for such functions as personnel, accounting, customer accounts, equipment ordering and purchase, contacting for services, and management of equipment and facilities.

## **Commercial Orientation**

The future water organization must create the financial conditions, through tariffs and cost savings, to be self-sufficient. O&M costs must be met, and funds should be set aside for future rehabilitation and capital expansion. These conditions can be met by managing the water service as if it were a commercial enterprise so that cost savings can be realized in all operating areas, while maintaining service standards.

A commercially oriented WSO has in place a system to bill customers and collect fees on a regular collection cycle. Meters will need to be installed where they are not presently in place, and they

will need to be read on a regular basis. Bills must be posted and given to consumers, or a prepayment system will need to be designed and installed. A collection structure will need to be developed. Cash must be deposited and managed to maximize the assets of the organization. Systems for meeting payroll and other accounts payable will need to be structured.

Each work unit of the organization must have clearly defined performance standards, e.g., the time required to install a meter. The most efficient use of vehicles and the use of petrol should be defined and monitored. The time required to produce and collect bills should be tracked. All of these measures, and more, will further the commercial orientation of the organization.

## **Efficiency and Quality of Performance in Operations and Maintenance**

The water organization will need to have cost-saving and cost-management procedures in place to minimize wastage. It should set service goals so that the time required to repair leakage in the system is minimal and the time required to set up a service connection is minimal. An eye to the cost of every item and the cost of labor must be continually monitored to minimize excessive expenditures. Performance standards should be set to monitor the amount of water going into the system from bulk suppliers and other sources and the amount sold to customers. Preventive maintenance routines must be defined for the distribution system and conducted and recorded regularly, i.e., valves regularly exercised, pumps maintained and maintenance logs kept up, distribution lines inspected routinely, leaks repaired, and unauthorized connections identified and addressed.

## **Consumer Orientation and Relations**

Water service should be provided to customers in sufficient quantity and quality to meet national standards. The WSO must be able to continually expand coverage to meet growing population needs. Consumers will need to have a consistent, reliable mechanism to pay for water services, with easy access to payment posts so they do not have to travel far to pay for bills and are not inconvenienced in waiting when paying bills. They must feel that the employees of the WSO are working hard for their benefit and are worthy of their trust. A mechanism needs to be in place to receive and act upon consumer complaints.

The WSO must pay attention to consumer demands for level of service, consistent with ability to pay, and it needs to develop a regular program to educate and inform consumers about the public health aspects of water usage, sanitation, hygiene, as well as issues around water loss and conservation.

### **Interaction with Key Stakeholders**

Linkages will be needed for the WSO to coordinate with key collaborating entities and to represent the interests of consumers in these interactions. For example, communication channels with the BWB will be important in representing the interests of consumers and with the TLC, in technical matters as well as cost and price issues. The organization's relationship with DWAF, which will be the major regulatory body for technical standards, will be important. NGOs will continue to assist communities with borehole and other community improvement programs. These linkages with other stakeholders must be managed and will require time and resources.

## **Human Resources Management**

The development of the WSO will require several years of continuous learning and growth for the staff and key managers. A perspective that values human development will be important to providing excellent services. Staff development and management of human resources should aim to provide opportunities for employees to take risks and to learn new skills.

### **4.2 Financial Requirements**

Cost-recovery through well-priced metering is the best way to ensure that a water utility is financially self-sustaining. That occurs through fair pricing and equitable distribution of water to all local communities. International experience clearly demonstrates that the best way to conserve water is to impose metered usage charges that are high enough to cover costs. With this principle in operation, financially self-sustaining water operations are assured. Fairness is also achieved through cost-recovery pricing schemes that control overall demand and substantially discourage both the outright wasting and frivolous use of water. Thus, (a) at the consumer level, each household pays for the amount of water it consumes, and (b) at the community level, water conservation helps to distribute even limited quantities of water fairly to all communities in the network.

#### **Cost-Recovery Tariffs, Charges, and Fees**

Tariffs, charges, and fees should be established locally, in response to local preferences for quality and quantity of water service. Locally established tariffs

also improve payment compliance, where local authorities are accountable for water tariffs and fees, rather than a distant, impersonal government that might also be an ineffective collector of water bills. Tariffs and fees must be set at cost-recovery levels. As noted below, this price-setting should include provision for rehabilitation of existing service and capital expansion for future service, in addition to covering current O&M requirements.

Overall charges for water service may include distinct components, such as metered usage tariffs (per kl of water consumed), monthly service charges (an additional flat charge per month per household customer), and specific service fees (for new connections, penalties, etc.).

# Metered usage tariffs (based on amount consumed) can encourage conservation by charging higher rates for water use beyond a specified minimum level. This principle is presently being applied in the tariff structure of the metered towns in Bushbuckridge, where a slightly higher rate is imposed for consumption beyond 50 kl per month per household. (The tariffs in these locations, however, appear to be well below cost-recovery levels, so these rates should not be viewed by local authorities as a guide to future water pricing policy.)

# Flat monthly service charges may be imposed in addition to metered usage tariffs. Monthly service charges are commonly used along with metered service. They may be set to cover some fixed costs of the water system, or merely as a supplement to the variable revenues from metered usage tariffs. If feasible, some communities might consider imposing a flat

monthly service charge per household even for unmetered (standpost) service, as a way to finance the earlier introduction of metered connections.

# Fees for particular services should be set to cover the costs of actually providing each specified individual service. Connection fees (for establishing new house or yard connections to a stand) are the most common service fees. Although many communities charge a single flat fee for new connections, differentially higher pricing for new connections may be recommended in particular situations, such as (a) hard-to-service sites (such as distant, hilly, or hard-to-access locations), (b) sites in congested areas, where additional costs arise (especially business or commercial customers), (c) higher-volume, or special purpose sites (for example, where a larger connection pipe is required to meet a particular industrial need). As with the cost-recovery approach as a whole, higher-cost users should not be subsidized by lower-cost users especially if higher-cost users are more financially capable than other users.

# Penalties may also be designed to use the price incentive to conserve water by influencing consumer behavior (so-called demand management). In particular, the most effective approach to the substantial problem of unauthorized connections may involve use of penalties with metering.

Water revenues must keep pace with rising expenditures, whether due to simple inflation or increasing operational costs. Regular reviews of water tariffs, charges, and fees are recommended. If revenues begin to fall short of spending, the local authorities must protect the

financial self-sufficiency of the water utility by increasing tariffs, charges, and fees accordingly. In this regard, formal annual pricing reviews are essential. During times of high inflation, several price increases during any one year may be justified.

### **Understanding and Monitoring Costs**

Local authorities may not be aware of the full list of costs for which they will eventually be responsible. (Later sections of this chapter and Chapter 5 provide estimated costs for each major expenditure category of a local water service organization.) In addition to the usual elements of O&M spending for water service, local WSOs must be fully prepared to cover the costs of personnel, bulk water purchases, and allowances for rehabilitation and future expansion. Personnel costs are generally expected to be covered by government subsidies during the early years of the transition. In the long term, however, full costs of all staff will have to be borne by the local WSOs themselves. Bulk purchase of water will be a major cost component as well. The bill for bulk water purchases will also increase in step with growing volume of water used. Heretofore, bulk water has been provided free of charge.

A fully self-reliant WSO regularly sets aside funds for the future, as allowances for (a) rehabilitation and renovation (to maintain the quality and quantity of service in the existing system) and (b) future capital improvement (to expand service). Such a capital allowance is especially necessary since local preferences for stand connections may generate water supply demands that exceed the RDP standard. This would obviously be the case if metered connections were widely sought (with approximate consumption of 100 l/c/d),

rather than the RDP standard of neighborhood standposts (with average consumption of 25 l/c/d).

### **Phased Introduction of Metered Stand Connections**

Metered connections appear to be the clearly preferred standard for water service in the future Bushbuckridge, Nzikasi North, and Hazyview. The convenience, public health, and standard-of-living aspects of metered connections are well recognized. The public's willingness to pay the costs for such service is widely attested, though not yet confirmed. Realistic water tariffs, based on the principle of cost recovery, may substantially exceed current expectations. Metered connections do, however, offer the greatest promise of achieving the three objectives of (a) adequate revenues to assure continued operations, (b) water conservation to assure equitable distribution to all areas, and (c) fair and accurate pricing to build popular support for a financially self-sustaining local water service.

It will take several years to introduce widespread metered connections into the area, due to the overall cost involved and the sheer volume of physical work required. Areas that could move quickly toward large-scale metering are those advantaged communities with established local government administration. Indeed, the introduction of metered service into any individual community will surely be hastened by the prior accumulation of funds to support the attendant costs of new connections and metering. Perhaps more important, a reliable local supply of purified water may be a prerequisite to the introduction of successful local metering. Thus, the geographic coverage of any potential metering scheme could be significantly constrained, depending

upon the extent of present and planned water purification in the area.

In light of potential administrative, financial, and physical constraints to metering, local authorities will need a phased program that introduces metering first in those places where it is most likely to succeed. The best candidates would be those communities with relatively established administrative and financial arrangements, to increase the likelihood of administrative cooperation and payment compliance. Early success will quickly be copied elsewhere, but initial implementation or financial difficulties could doom the venture from the outset.

### **Unauthorized Connections**

Unauthorized connections are one of the most troubling problems facing the entire water distribution effort in the BWB service area. They drain substantial amounts of water from all parts of the distribution system, and the informal connection techniques which are used worsen the problem through water leakage. Although unauthorized connections seem to be easy and inexpensive to make, they are extremely difficult to combat. Even a determined effort by authorities to disconnect them would likely be defeated by the perpetrators reattaching their connections at an early opportunity.

Encouraging customer responsibility and putting a system of equitable metering in place might possibly turn the tide. Under this approach, rather than attempting to disconnect unauthorized connections, the local water service organization could embark on a well-publicized campaign to meter all connections (including unauthorized ones) and identify and heavily penalize the offending households. Selected unauthorized connections could be

metered and tracked to their delivery point. Once identified, the offender might then receive a stiff penalty (perhaps several times the formal connection fee, with additional penalties for late payment), receive a bill on a regular basis for the subsequent water usage, and clearly be put on public notice that further pilferage will not go unpunished.

## **4.3 Technical/Engineering Requirements**

### **Asset Description**

Decisions and agreements must be reached about specific assets are that will be transferred to local authorities. These agreements must clarify very openly what the responsibilities of the BWB will be, and what the local authorities must handle themselves. For example, will storage tanks serving communities be part of the bulk system or part of the distribution system, and thus under the management responsibility of the local authorities This issue must be decided and agreed upon for each and every locality. (For example, the storage reservoir in Acornhoek might be part of the bulk system, while the storage reservoir in Cork might be considered a part of the distribution system.)

A complete inventory of infrastructure assets should be assembled, including pipe sizes and locations, valve locations, diesel engine and pump specifications. This inventory should include materials, tools, equipment, spare parts inventories (by item number), and vehicles. All items, including community distribution systems, borehole pumps, and all other equipment should be turned over according to a prearranged schedule (which may be criteria-based rather than calendar-based). All asset transfers

should be based on a process that authorizes certain individuals to act on behalf of local government.

### **Definition of Asset Condition**

The asset transfer process should allow for acceptance or rejection of the transfer based on mutually agreed upon criteria. These criteria should be realistic and acceptable to all parties so that DWAF can plan for and complete any required rehabilitation or component replacement prior to scheduled turnover. For example, local authorities should not have to accept distribution systems with broken valves or diesel pumpsets which require immediate repairs. Likewise DWAF should know what constitutes an acceptable asset condition. A mutually agreeable process for inspection of assets at transfer should be decided.

A particularly difficult point of discussion may be the rationalization of unauthorized connections within community distribution systems. A logical program would probably involve both DWAF and local authorities to manage this especially tricky situation.

### **Information Requirements**

In addition to receiving physical assets in operating condition, local authorities should also receive all O&M manuals, all past O&M records, and all current guarantees, warranties, and in-force service contracts. Of particular importance is transfer of all design and as-built drawings, construction records, names of contractors employed, etc. for distribution systems that local authorities must manage. This information should also include borehole specifications including depth, casing material, static water level, yield, and drawdown information as well as pump setting. All

of these plans, designs, and records make up the software requirements that allow for efficient operation and maintenance and permit preventive maintenance planning.

### **Definition of Responsibilities**

Although many O&M responsibilities will be defined by the assets that are transferred, certain responsibilities may not be clearly enough defined to ensure proper overall system management. For example, if local authorities are to be responsible in any respect for unauthorized connections to bulk lines, these responsibilities must be clearly defined and agreed upon. Similarly if local authorities are to be responsible for the security of assets of the Water Board such as pipelines, pump stations, or regional storage reservoirs that may lie within community boundaries, this must be properly spelled out. At some point, the allocation of responsibilities within local authorities for example, among the TLCs, CRDCs, and water committees will need to be clarified.

### **Existing O&M Staff**

It is clearly the intention of DWAF to second (and eventually transfer) staff currently performing O&M duties to the BWB and local authorities. Local authorities should have the opportunity to evaluate all available staff and participate equitably in the selection process so that the BWB and each local authority can share the limited skills available within this pool. A fair process of staff selection from this pool should also allow local authorities to reject particular staff due to lack of requisite skills, unwillingness to perform assigned functions, or any other rational and acceptable reason.

In addition to employing the existing O&M staff, local authorities should consider and develop a process for recruiting personnel with skills not found within the available staff pool. This recruitment process calls for outlining job descriptions and requirements for employment for each staff position. The skills that will not be found within the existing O&M cadre include bookkeeping, financial management, education and training, and possibly mechanical and pipefitting skills.

### **Current Facility and Equipment Requirements**

At present, local authorities have no office space, office equipment workshop facilities, equipment, or communications capability. Local authorities will have to reach agreement with DWAF and/or others to ensure that necessary facilities are made available or that access to them is assured. Local authorities will not be able to take on O&M responsibilities without at least some basic facilities from which to work.

Local authorities will also need to have certain essential equipment, such as pipe cutters and threaders, tripods and lifting equipment to pull pumps from boreholes, and most especially appropriate vehicles in working condition. Some of this equipment may be transferred as part of the turnover of existing assets. However, this may not always be the case, and provisions for local authorities to obtain the necessary equipment must be a part of the transfer program.

### **Long-Term Infrastructure Planning**

Since all future water supply infrastructure development within a local authority area will have O&M impacts,

local authorities should have the best available information regarding water supply needs and community priorities. Local authorities and their WSOs should participate in long-term infrastructure planning at an early stage. Although this planning process may be led by others (most likely DWAF), it is critically important that local authorities participate and know that their concerns and priorities for development are heard.

### **Future Infrastructure Development**

Prior to transfer of assets and responsibilities, a clear policy regarding financial and technical responsibilities for future infrastructure development should be agreed to. This includes decisions concerning what is considered to be infrastructure development and who will finance and manage it. Of particular importance in this definition will be current and future rehabilitation programs, which might be considered system repair. Initial establishment of metered household or yard-tap connections within a community, which could require significant capital expenditure, should also be discussed within the context of future infrastructure development.

## **4.4 Social and Consumer Requirements**

### **Consumer Awareness and Rights**

Transfer of water supply from central to local authorities implies profound changes in the way people currently receive water. Residents in the study area have become accustomed to dependent, passive relationships where water is free. They will have new rights and responsibilities as paying consumers

under the new structure, roles that are unfamiliar and not clearly understood. Local authorities must ensure transparency and move quickly to build trust and confidence between the providers of water services and the consumers they serve. This will require a communication strategy to create awareness of new policies, consumer rights to effective service, and the responsibilities of paying customers. A necessary first step is building commitment among RDCs, tribal authorities, and councillors to a commercial orientation and understanding of financial viability and then to organizing community or ward education campaigns.

Effective and reliable mechanisms for communication and feedback will need to be established at the community level, either through water committees or other channels, and within the water organization structure(s). Management will need to ensure that commitment to service is conveyed and enforced at all staff levels. A customer orientation may be new to staff, especially those transferred from DWAF. They may not fully understand the role that users or consumers can play in improving the effectiveness of services. In community-managed services, water committees will need to ensure that committee members understand and fulfill their roles. This includes administering, managing, and monitoring the system operation and consultation with other community members. In all instances, committee members or organization staff must be clearly identified to the community.

### **Education and Behavior Change**

Educational campaigns must be launched regarding unauthorized connections. This sensitive topic will require coordinated

efforts and cooperation among councillors, RDCs, and tribal authorities to mobilize local support in containing the problem. Users must accept their responsibilities as consumers to protect the water system against misuse, vandalism, and unauthorized connections. Such education should be an immediate priority and should attempt to involve users in identifying ways more equitable distribution can be achieved, even within the current malfunctioning system. For example, there may be ways to rationalize water use in home gardens or agriculture activities right away, even before the system is normalized. Such a program should also look into water conservation and loss prevention.

At the same time, regular programs should be set in place regarding the public health aspects of water usage and sanitation. Local authorities should insist that health and hygiene education, along with behavior change goals, are included in the design of all water projects. More information is needed regarding community knowledge, attitudes, and practices as well as residents' willingness and ability to pay. Initially, this information-gathering might take the form of a baseline data survey. Later, as the water system matures, such information collection could become the basis for strategic planning on expansion or the design of marketing activities. As a management system is set in place, staff must understand and be able to use such information in guiding decisions regarding service levels. Accurate information regarding population is critical.

Women, as the primary users, collectors, and managers of household water, have a central role to play at the community level. There should be clear commitment on the part of all stakeholder organizations to promote the

appropriate involvement of women and to facilitate their effective participation. This includes management roles within community-based water committees, outreach in educational campaigns, and delivery of health and hygiene education.

### **Structure for Community Participation and Management**

Effective and representative community structures are necessary to implement consumer campaigns, negotiate distribution and service issues at the community level, and, in some instances, manage community-based facilities. Local authorities must ensure that such structures are in place, functioning, and responsive to local users. Clear roles and responsibilities must be identified and negotiated and mechanisms established for coordination and management with the water service organization.

## **4.5 Human Resource Development Requirements**

### **Training for Managers**

Development of the WSO will require a different type of management from what has been traditionally provided by government. Managers and supervisors, board members, and local authorities will need to learn how to operate a commercially-oriented enterprise dedicated to consumer service. This will require management training during the transition from the present configuration to a fully functioning WSO. The following list illustrates essential knowledge and skills that are required:

- # The role of the manager: How is a manager different from a technician

- # Essential communication skills: How can managers communicate clearly in spoken and written word and present ideas clearly to others
- # Giving and receiving feedback: What are successful and effective ways to give and receive information about performance
- # Conducting meetings: How should meetings be managed to achieve follow-up and results in a minimum amount of time
- # Working with staff to achieve results, human motivation: How can the manager and supervisor get the most out of people
- # Organizing work with staff and delegation, situational leadership: How does a manager select the right person for the task and ensure that he or she receives the coaching and help needed to do the job What management techniques help motivate people to get the job done, when they know how to do it
- # Defining performance standards and the performance management process: How should managers define work performance measures and monitor them
- # Using management information to monitor performance: What techniques should managers use to analyze data on financial, technical, and work performance and use them to improve productivity
- # Planning strategies and planning processes: What are the steps to developing a work plan, a strategic plan, and a performance improvement plan
- # Leadership: How can managers and supervisors provide a model for others to follow and lead others in ways that inspire trust and confidence

## **Technical Training**

It is clear that many of the existing O&M staff, who are available for secondment and eventual transfer to local authorities, are not highly skilled or literate. If local authorities are to take responsibility for providing water supply service, it is important that the technical staff have adequate skills to do their jobs. Therefore, local authorities should have at their disposal technical training programs that allow skill improvement for the staff under their management. These training programs should be available and open not only for current staff who are likely to be seconded, but also for staff that the local authorities may choose to employ after transfer of services.

## **Local Capacity-Building**

Steps must be taken to ensure that communities have the capacity to mobilize and educate users on their rights and responsibilities as consumers, identify and

monitor water-related needs, promote responsible water usage, and ensure that public health requirements are met. Such outreach and community training may be done through the RDC, water committees, or other arrangements. Where communities are responsible for local system management, water committees must have the capacity to take full responsibility for operation and maintenance, tariff or levy collection, system administration, and coordination with the water service organization if necessary. Programs or opportunities for such training should be identified, organized, and made available to the appropriate individuals.

# 5 ~~TRANSITION~~ WATER SUPPLY

In the future, when the assets and responsibility for provision of water supply service are transferred, each local authority must have in place an organization prepared to provide operation and maintenance of a water system as described in Chapter 4. For the most part, local governments will be building a water service function from the ground up; to arrive at the desired end (a self-sustaining, community-wide system), time and a transition process with assistance will be required. The strategy for this will inevitably be a step-by-step process. Chapter 6 describes a recommended program structure for such a transition. The full picture of how the future might appear some years hence is presented here.

This chapter describes different options for management of the water distribution services, and provides an illustration of the structure of a model water organization. The model described could operate either as a water department in a typical town or township (appropriately linked to community water committees), or it could operate as a municipal company (completely owned by the local government). The model water organization could also be operated in the form of a contract. Each of these options is described. The way that the water organization is controlled by the local government is referred to as the governance structure, which should not be confused with national or local authority governance.

Local authorities might select one of the proposed water supply governance structures as they move forward in establishing such

organizations. Criteria for selecting the most appropriate form are described in Section 5.1; Section 5.2 gives definitions of three governance options and their strengths and weaknesses. The three models discussed are local administration (a water department), municipal corporation (public-public partnership), and contract operations and maintenance (public-private partnership). The privatization model is not discussed and is not considered viable under current conditions.

The functions of a well-managed WSO are presented in Section 5.3, followed by an illustrative organizational structure in Section 5.4. In the final section, a cost scenario is presented for the hypothetical water organization.

## **5.1 Criteria for Selecting a Governance Structure**

The structure for water supply governance is the primary and fundamental decision local authorities must make in developing a financially sustainable, well-run WSO. This structure will determine how services are delivered, reporting relationships for the manager of the WSO, and processes for decision-making regarding policies, growth, profitability, and service levels. It will also determine the relationships with civil society structures (i.e., LRDC, CRDC, water committee), political structures (the local authority) and the internal structure itself (see Figure 3). Any governance structure chosen

**Figure 3**  
**Relationships between the Water Service Organization**  
**and Other Governmental Structures**

will need to have a water organization that can provide the services described below in Section 5.4; its organizational structure will look more or less like Figure 4 in that section.<sup>7</sup>

The water manager should be responsible for the day-to-day operations and supervise staff. He should be an employee, not a publicly elected official, as it would be a conflict of interest if any one of the councillors were also the manager of the WSO. The manager needs to be held accountable for his or her performance and for the performance of the water organization. The governance structure must be able to appoint and dismiss the water manager.

In defining this governance structure, a number of questions will need to be addressed: What type of WSO should be built? Should it be a water department with municipal staff hired (or seconded) to operate it? Or should it be structured to perform as if it were a municipal business with the staff as employees of a municipal water company? Alternatively, should the local authority hire a contractor to manage the water service and not take on the responsibility for the staff that the government wants it to absorb? What are the political considerations in each of these ways of governing? With the scarcity of employment in the project area, other

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<sup>7</sup> It should be made clear that each local government unit now has or will have a municipal staff, such as a town manager and employees, to deal with a series of municipal functions. The town employees are governed by a town council (the political dimension) and directly supervised (usually) by a town or city manager (the municipal function). Currently the town council is termed the Transition Local Council, but eventually this will be called a local council. The town council is elected. Municipal employees are appointed. One cannot be an elected official and a municipal employee at the same time.

questions must be faced. Should the water organization be allowed to be a source of political patronage, or should it be a professional organization? How will the civil society structure and the local authority relate to the water services structure? How will relationships with community-based water committees be structured?

As mentioned in Chapter 4, certain criteria should be considered in structuring and managing the WSO. These characteristics have been derived from studies that EHP has conducted comparing successful water organizations around the world.

#### **Operational Autonomy: Ability to Manage without Interference in Daily Decisions**

A water service organization needs to be able to respond quickly and effectively to consumer requests without being pulled in several directions at once or needing to check with the local authority for decisions. It needs to be able to consider all of its customers in making those decisions, not only a chosen few who have the right influence. Services will be compromised if the manager has to answer to 15 bosses, all of whom are powerful elected or appointed officials. The water manager should not have his priorities reshuffled by higher authority, for example, every time someone with influence wants a water connection. The staff need to be able to perform their jobs as professionals, not as servants of the politicians and vocal community members. The governance structure should minimize interference and maximize operational autonomy.

#### **Responsiveness to Consumers and Ability to Link with Existing Community Structures**

The governance structure needs to allow for coordination with and possibly integration of community water committees. Such community-based structures provide the logical link through which services can be coordinated and even possibly managed. During the beginning years of the water organization, close coordination will be particularly important in addressing sensitive issues surrounding unauthorized connections, payment of services, conservation, and equitable distribution of scarce resources. Committees can be channels for consumer education or awareness campaigns. Committees may also need to assume responsibility for the management responsibilities of small systems such as boreholes. Eventually, such structures could, in many cases, become a part of the water service organization or work as affiliated members.

#### **Efficiency: Capacity to Achieve Economies of Scale and Operate Economically**

The WSO needs to have flexibility and capacity to save on expenditures where it can, and not be burdened with bureaucratic requirements that take more time and cost more money than necessary. It needs to be able to purchase equipment as quickly and economically as possible without going through multiple levels of red tape. It needs to have the financial resources to purchase in bulk and save through economies of scale.

#### **Capacity to Grow and Transform**

The WSO needs to be able to join with other water providing organizations in the area where unnecessary duplication or overlap exists. Should future situations

develop where the WSO can serve consumers more effectively by merging with neighboring local authorities, the governance structure should not prohibit this possibility.

#### **Ability to Manage Staff**

For the WSO to operate cost effectively, employees must be held accountable for results. No one, at any level, should be allowed to hide behind a lifetime guarantee of employment, with no regard to performance. In the current situation, local WSOs will be absorbing civil service employees seconded from other government agencies. An essential ingredient of autonomy will be the ability to hire and dismiss staff and hold them accountable for results. WSOs and local authorities need to avoid the situation found in many other parts of the world where rules for seniority, promotion, and other measures not related to performance have strangled the effectiveness of daily management.

At the same time, local authorities must ensure that sound personnel policies are set in place within the WSO to protect employee rights and guard against unfair hiring practices by political forces and others who may have power for short periods. If the WSO is a creature of political whim, the staff will change with each administration, continuity will be lost, and training expenditures wasted.

#### **Flexibility to Meet Growth Requirements**

The service area of the BWB will become increasingly complex, and the population will grow. Issues of long-range planning are important to the future. The WSO will need to have access to good staff for planning, either through contractual services or with core employees. Some

degree of technical capacity will be required to balance the power of local government against the monopoly power of the bulk water supplier that will sell water to retail WSOs. The organizations will need to be able to reorganize periodically, to develop efficiencies through setting up network teamwork approaches and to grow.

### **Ability to Manage a Self-Contained Budget**

As mentioned earlier, the budget and the income of the WSO must be maintained separately from the accounts of the local authority. There will not be enough income from water service to support other municipal functions. The WSO is, by nature and design, a nonprofit public service; any surplus generated should be used to improve service, to provide incentives for improved staff performance, and to expand service. The initial years of the organization will require subsidy.

## **5.2 Options for Governance Structures**

Governance determines who controls the WSO and how it relates to its external stakeholders. There are three basic models that could be viable under current conditions in the project area.

### **5.2.1 The Direct (Local) Administration Model**

The direct or local administration model has two versions: (1) the mixed administration structure and (2) the self-contained water department. The **mixed administration** structure is the version followed by Hazyview and most small, traditionally white, towns in South Africa

(and most small towns around the world). In this design, management of all municipal functions such as water are combined under village governance. A technical services manager may provide supervision for water, streets, and all municipal infrastructure as one department. The town clerk may serve as the billing and collection locus: bills may be paid directly at the town hall, sent as checks by mail, or in some instances, collected through agents such as the local post office or a local store. Income from water services becomes part of the municipal budget. The mixed administration model serves small populations reasonably well, especially towns that do not need to manage a sewage treatment system, which is more complex than a water treatment plant.

As villages grow into towns, more staff are added but reporting relationships often remain unchanged. The direct budgeting and financial relationship remains in place as the village grows, and any excess income from one service is used to fund other town functions. The infrastructure, or water manager, reports to the town manager. Technical staff report to the water manager, and the other service functions (consumer, billing, etc.) report directly to the town manager, who essentially serves as executive director of all departments.

A variation on the mixed administration model is the separate or self-contained water department. This version is typically seen in villages which have grown sufficiently large to justify hiring a water manager with the sole responsibility of managing the water organization staff. All water staff and departments that appear in Figure 4 (found in Section 5.4) would report to the water manager. The water manager would report directly to the (elected)

town council and not to the town manager. Water accounts and funds are separated, and in effect a small water company is managed within the town structure.

### **Strengths of the Local Administration Model**

- # The model is simple to administer and works well for small populations. There are many examples of this model in South Africa, and people are familiar with it.
- # In the mixed-services version, economies may exist in the delivery of different services by the same department or individual. For example, the town clerk may collect for water and other services at the same time.
- # Managerial control rests with the town manager (in the mixed administration model) and is not divided among a cadre of department heads. Scarce and more costly managerial skills rest with one person, thus administration budgets are lower, compared to other models.
- # Consumers can place all responsibility on one body, essentially the town manager or town council, for service and complaints.
- # Town priorities for new investments may be easier to set since levels of review in lower departments are not required.
- # Councillors become familiar with the business aspects of water management.

### **Weaknesses of the Local Administration Model**

- # In this model, it is difficult to link tariffs with service delivery. All revenues are considered town

revenues rather than water service revenues and are often mixed in a common account. As personnel serve multiple municipal functions, it becomes difficult for the manager to know where funds are being spent.

- # In the mixed administration model, the water manager does not have direct control over all staff working in the water area, making it difficult to monitor performance by achievement of results.
- # As the public image of government-run services is often poor, consumers may be reluctant to trust political management and desire professional management.
- # As civil service employees, staff have little incentive to perform their work efficiently because they are assured of civil service protection. Whether they work hard or little, they are paid the same. Further, because of requirements for grading levels for public servant, staff pay cannot be based upon performance.
- # Staffing and promotions are usually by seniority rather than by performance.
- # The staff who will be seconded to a WSO or local authority will be its responsibility for all of their working lives.
- # The direct administration model becomes increasingly inefficient when dealing with populations over 10,000, because it is designed to operate as a public service rather than a business.
- # The water department will not be likely to have a dedicated utility budget, unless special measures are taken to that end.
- # The town manager or mayor must approve all expenditures, although usually lacking any training in water management. The result is often delays and energy spent convincing or

educating him about water service functions.

- # The concept of a self-contained utility is often lost in this model. A self-contained utility is a business unit. In the direct administration model, the water department is not generally viewed as an enterprise; the only one who may consider it such is the mayor or the city manager.

### **5.2.2 The Municipal Company Model**

The municipal WSO is set up with a governance structure much like a corporation or business, but all assets are owned by the local authority. The WSO is governed by a board of directors that supervises the water manager. Employees are hired under the statutes regulating public sector companies or public corporations. They work for the municipal water company rather than the local government authority. This model is sometimes referred to as one form of public-public partnership (others might include contracting with other public organizations for services).<sup>8</sup> The company has a corporate charter that governs its functions and its employees. It has its own set of personnel policies and its own internal regulations. The membership of the board of directors is dictated by the local authority, which decides within the bylaws of the company charter who should serve and the term of service.<sup>9</sup>

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<sup>8</sup> Rand Water or the Northern Lapele Water Board is an example of a public sector company for bulk water supply.

<sup>9</sup> For example, the board could contain four councillors, three Water Committee members, three LRDC representatives, two local business people, one Engineer from DWAF, one teacher/professor from a local school or university. The chair heading the board

Assets are owned by the local authority, and the WSO operates on its behalf to meet the public service policy goals required through its charter. For example the charter could require 24 hours of service per day to all consumers who pay at the most cost-effective tariff. The water manager is appointed by the board and serves at its pleasure. He can be dismissed, rewarded, or given incentives based upon performance. The staff may also have these conditions within the established bylaws.

### **Strengths of the Municipal Company Model**

- # The WSO is protected from daily interference in its management processes by the bylaws governing the public corporation and by the board, which serves as a mediator between the political powers and the WSO management.
- # Civil society structures can be directly represented in the governance by inclusion on the board of directors. Broad representation of the public can be structured into the board governance as well.
- # Legally the municipal company can be structured to have all the latitude necessary to operate as an incorporated economic unit: ability to contract for services, board participation, flexible structure with checks and balances for management, and capacity to enter into financing

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could be the mayor, or could be elected among the members. The board meets periodically (from four times a year to once a month, depending on needs). The water manager presents the results of the work, reports on financial matters and strategic plans, requests for policy, etc. The board approves or denies and instructs the water management to implement.

- arrangements with national and international sources.
- # Ownership is protected; the local authority maintains ownership and the public trust is provided for.
- # Administrative and management procedures can be formulated by the company itself. It can delegate functions within the ranks from the water manager on down. It can modify the management structure or decentralize as required.
- # Financial affairs such as tariffs can be formulated by the municipal company with the approval of the board and the local council. Budgets can be developed by staff and approved by the board; revenues can be retained to cover operating costs. Financing for capital costs can come from a variety of sources.
- # In this model, tariffs and service delivery are linked; the public service company retains the revenue collected and has responsibility for budgeting and accounting for operations and maintenance. Linking revenues and expenditures provides an incentive to operate more efficiently.
- # Personnel may be engaged or dismissed within regulations established by the company. Remuneration may take a variety of forms, including bonuses and incentive pay. Any seconded staff would need to transfer to the water company's roster and be governed by its personnel regulations.
- # The organizational culture of a company differs greatly from a government department. A company is an economic unit that must operate cost-effectively while serving its customers. The employees' sense of identity and loyalty can be very strong and positive if the company is well managed.

- # Economies of scale are possible under this model. The company may join with others like it to increase the size of the service delivery area consistent with agreements with other local authority-owned companies.
- # Public sector companies can be authorized to borrow from the private sector to finance water and wastewater systems; however, companies are only able to borrow if they are credit-worthy, which means tariffs must be high enough to cover O&M and capital costs.

#### **Weaknesses of the Municipal Company Model**

- # The model is unfamiliar to many people in the project area, and managers and councillors would need to learn how it works. Many might be surprised that any model other than the direct service water department is conceivable. Initial attitudes may be that a municipal company will be far away from the people, when it will, in reality, be no further removed than any other municipal service. Councillors who want to control the water service directly may feel at a disadvantage, having to work through a board of directors to receive attention.
- # The perspective of a municipal company is business oriented and people are accustomed to thinking of the water company as the provider of a social service rather than as a community enterprise. The change in thinking required will need time and education.
- # It will take a three-to-five year education and training period for staff to learn to work as a team in a business-like structure. Staff training will be required and outside technical

assistance will be needed, with financing from donor organizations or the central government (DWAF).

### **5.2.3 The Contract Model**

Contract management by a private company is permitted under the water services White Paper and proposed laws. It provides for the delegated local authority (as the water supply authority) to appoint a water service provider (WSP) as an agent to operate and maintain the infrastructure and to bill and collect tariffs on its behalf. The local authority may even appoint a water committee, or any other legally constituted entity that has the capacity to provide the services, to act as a WSP on its behalf. In the contract model, the assets of the water service (pipes, equipment, infrastructure) remain the property of the local authority, and the WSP is required by contract to maintain them. The local authority may also require that the WSP provide certain equipment, such as vehicles and office equipment, under the terms of the contract. The contractor is responsible for retaining, dismissing, and remunerating all staff, or certain staff may be designated as employees of the local authority who are seconded to the management control of the WSP or contractor. The terms of the contract may specify that all collected tariffs remain the property of the local authority and are directly turned over to it for its own accounting purposes, or they may charge the contractor with maintaining an auditable financial management function for the authority in trust. This model is sometimes referred to as a public-private partnership. It is often confused with the term privatization, which it is not. Use of the private sector to perform work contracted by local government has often occurred for a variety of functions

(garbage collection, typing services, making copies, etc.). Privatization is a model that is not discussed here; it involves selling or leasing all the assets of the infrastructure to a for profit company that operates as a regulated private utility.

#### **Strengths of the Contract Model**

- # Competition in selecting a designated operator gives the local authority the advantage of obtaining services at the lowest bid that is credible .
- # The private sector is often far more efficient than the public sector, and this can be reflected in lower tariffs for the consumer.
- # If the contracting firm does not perform, it can easily be dismissed and replaced by another that is willing to do the job.
- # A private contractor can formulate its own management procedures unencumbered by red tape and can delegate from its director down through the ranks. It can set performance standards for its staff and more easily discipline and reward good performance.
- # Incentives for good performance can be built into the contract to stimulate higher levels of performance and greater consumer satisfaction.
- # The contractor can be required to provide regular communication with community and civil society structures and serve the public interest within the terms of reference.
- # Tariffs are totally regulated by the local authority.

#### **Weaknesses of the Contract Model**

- # The communication linkage between the local authority and the WSP is managed by the town manager and/or

the water councillor. In this linkage there is ample room for corruption. Communication difficulties can arise if the water councillor or town manager does not clearly communicate with other councillors or the executive committee of the local government.

- # Under this model, it may be easier to avoid interaction with civil structures and community water committees unless clear linkages are structured.
- # Supervision and oversight of the contractor requires skills and knowledge within the local authority on the same level as the contractor. Training in contract management will be required for the linkage supervisor from the local authority.
- # Attitudes towards private sector management may be negative, and councillors may feel that this model does not allow local people to learn how to do the work, unless the contractor is required within the terms of reference to hire a certain percentage of local staff.
- # The local authority and the public are unfamiliar with this way of conducting public services, and a period of learning and adjustment would be required on both sides to be able to learn to work with it.

### 5.3 Functions of a Water Service Organization

This section describes a possible future water organization structure. This new organization will need to be able to undertake a range of tasks and services:

- # Receiving complaints from water system customers
- # Planning and prioritizing the activities of the water organization staff in

response to complaints and long-term system requirements

- # Planning and coordinating with DWAF and community structures for system upgrading and expansion
- # Maintaining water distribution systems in communities by repairing leaks, replacing broken valves, cleaning water storage reservoirs, etc.
- # Maintaining borehole water supplies in communities not adequately served by the bulk water supply system by ensuring fuel availability, repairing or replacing pumps as necessary, maintaining and repairing engines and electric motors when necessary, etc.
- # Controlling unauthorized connections by disconnecting or metering
- # Contracting for services (such as engine overhaul, motor rewinding, and perhaps vehicle repair) which are beyond the capability and capacity of the water supply organization
- # Establishing metered connections in areas where this is practical and desired
- # Purchasing, maintaining and controlling an adequate stock of spare parts for system maintenance and repair
- # Reading meters (and repairing or replacing them as necessary) to enable accurate water billing
- # Collecting revenues from customers so that bulk water can be purchased and maintenance and repair can be assured
- # Managing transportation so that the functions of the water supply organization can be efficiently carried out
- # Managing and paying water organization staff
- # Conducting awareness campaigns related to the need for payment for water service, control of unauthorized

connections, water conservation, and hygienic use of water

- # Managing and controlling payment for bulk water, materials, spares, equipment, and for other required services.

## 5.4 Illustrative Water Supply Management Organization

### Assumptions

In order to give an example of a water supply management organization, certain assumptions must be made regarding area and population to be served and the types of water supply infrastructure involved. Although the characteristics of five local government areas are different, certain similarities exist that allow the development of an illustrative case and can inform the decision making process in each local government area. The assumptions do not correspond exactly to any one of the local areas, but are representative of the situation in all. The assumptions used are as follows:

- # Total population is 300,000, in 37,500 households.
- # The local government area is divided into six wards.
- # The local government area consists of 35 communities.
- # Twenty communities are connected to the bulk supply (three are served reliably 24 hours per day).
- # There are 168 boreholes (120 diesel-pumpsets, 45 handpumps, and 3 electric pumps) which also provide water to customers.
- # Initial average water consumption area-wide is at RDP standards (25 l/c/d).
- # Some percentage of the customers have metered connections.

- # Some customers are willing to pay and do pay for water.
- # Borehole water supplies are managed and maintained by local government.
- # Capital improvements are largely implemented by DWAF and other outside agencies.
- # The organization and staffing levels are illustrative of the end of the transition process.
- # The organization will primarily serve domestic consumers because there are very few industry or business clients in the service area.

### Structure

The overall structure of the illustrative water supply organization is shown in Figure 4. The structure provides for a manager with day-to-day responsibility for provision of water supply services. The manager is supported by a director for operation and maintenance responsible for field maintenance and repair of infrastructure, a director of consumer affairs responsible for contact and communications with water system end-users, and a director for finance and administration responsible for financial control and administrative matters. A total staff complement of nearly 200 is assumed.

The O&M section includes a central workshop (staffed by skilled artisans) and stores facility (staffed by a procurement officer and storekeepers). A borehole O&M subsection consists of 60 operators for 120 diesel-pumpsets, and five crews responsible for fuel delivery, maintenance, and repair. A distribution system subsection includes five crews dedicated to distribution system maintenance and repair, and five crews dedicated to service connections (new metering, disconnection for nonpayment, etc.).

The consumer affairs section is staffed at the local government level by a revenue

**Figure 4  
Structure of a Water Service  
Organization**

officer, revenue clerks, and meter readers who manage billings and collection and a consumer affairs officer who manages ward-level operations. Ward-level operations include community awareness and education, complaints, and payment.

The finance and administration section manages overall finance including income from collections and payments for staff, materials and equipment, bulk water, and all other expenditures necessary for O&M management. Administration includes personnel and training, security, and general record-keeping for the WSO.

*This is only an illustrative structure.* For particular local government areas, staffing levels may vary depending on the particulars of the infrastructure to be managed, the population to be served, the levels of service provided, and perhaps most importantly the availability of revenue to cover costs.

### **Primary Functions and Tasks**

Key to the functioning of the structure as outlined are the ward-level offices in the consumer affairs section. It is here that complaints about breakdowns, leaks, and requests for house connections are received. It is here that payment for service is made. And it is at this level that community outreach campaigns so critical to consumer awareness are managed and conducted.

Billing and collection functions are also managed by the consumer affairs section. In the illustrative example, meter readers will read household meters on a monthly basis. (The example assumes four meter readers, but as more metered household connections are made, more meter readers may be necessary.) Manual or computerized records are kept in this section as well.

As complaints and requests are received, these are passed to the O&M section which must prioritize activities, plan around transportation needs and limitations, and

schedule maintenance and repair work. The proposed staffing levels for borehole operations and distribution systems will depend on the exact mix of borehole and bulk supply infrastructure.

In some areas five crews will be more than sufficient, and in others, this may not be enough. The skills and efficiency of these crews will also vary and must be taken into account in managing the work load. A central workshop has been assumed to house tools and equipment for more extensive repairs that cannot be completed in the field. A more skilled mechanic and an electrical technician should be available for workshop repairs and to assist in more complex field maintenance and repair. Some repairs, such as machine work and electric motor rewinding, must be contracted out as these are specialized tasks, beyond the capacity of staff and equipment needed for a normal level of operations. A procurement office and storekeepers to manage and maintain tools, equipment, materials, and spare parts are assumed to be a part of the O&M section, although they could as easily be part of the responsibility of the finance and administration section.

Revenues collected by the ward-level payment clerks are registered by the billing and collections subsection to ensure proper customer accounting and then passed to the finance subsection of finance and administration. It is here that all budgeting and accounts are managed and reconciled. This subsection should also be responsible for budgeting and tracking budgets in order to ensure that expenses do not outstrip income. This subsection should be responsible for all payments made on behalf of the water management organization. The administration subsection should manage staffing issues including personnel records, disciplinary actions, training, etc.

This subsection should handle other miscellaneous matters such as security, administrative record-keeping, and the like.

The manager of the WSO should take the lead in planning and coordinating with outside agencies such as DWAF, the Mvula Trust, and others. He should provide overall leadership and guidance in the management of the organization. And he must respond to the suggestions and direction of others within the local government structure, be they councillors, RDC members, or water committee members. He will, of necessity, participate in the planning and prioritizing of work to be completed by the organization.

## 5.5 Illustrative Cost Structure

An illustrative expenditure budget of the hypothetical WSO was constructed as a guide to local authorities for future planning. Fully staffed and providing water to a hypothetical population of 300,000, total annual expenditure of this WSO is estimated at R15.325 million. The detailed budget is found in Appendix E. A summary of the major components is shown in Table 2.

**Table 2**  
**Summary of Estimated Expenditure Budget**  
**of a Hypothetical Water Service Organization**

Item	Annual costs R (000's)
Personnel	3,942
Bulk water purchase	5,594
Administration	652
RSC levies	59
Energy	456
Transport	2,214
Chemicals	0
Stores	490
Equipment	806
Contractor and other services	412
Reserve fund for rehabilitation	200
Allowance for future capital improvements	500
<b>Total</b>	<b>15,325</b>

Two alternative assumptions were considered possible regarding the level of metering at the end of the 5-year transition period, when full local responsibility for water service is reached. (These financial outcomes

are explained and presented in detail in Appendix E.)

# The more optimistic scenario is that 30 of the 37,500 households

will have metered stand connections.

If subsidies were to be phased out in 8 years (perhaps a reasonable alternative to the planned 5 years), and if 30 of households had metered stand connections, breakeven operations would require a water tariff of R2.059 per kl of water consumed. This would generate an average monthly water bill of R80 per metered household.

If, alternatively, subsidies were to be phased out in 10 years, the same 30 metered households would face a water tariff of only R1.397 per kl, yielding an average monthly bill of R64 per metered household.

If, however, subsidies were to be phased out in the scheduled 5 years, those 30 metered households would face a water tariff of R4.048 per kl, translating into an average monthly bill of R128.50 per metered household.

# The more pessimistic scenario is that 15 of the 37,500 households will have metered stand connections at the end of the 5-year transition period.

If subsidies were to be phased out in 8 years, with 15 of households metered, breakeven operations would require a water tariff of R4.37 per kl, equivalent to an average monthly bill of R136 per metered household.

If subsidies were to be phased out in 10 years, the 15 metered households would encounter a breakeven tariff of

R3.239 per kl, equivalent to an average monthly bill of R109 per metered household.

Finally, if subsidies were to be phased out as planned within 5 years, the breakeven tariff for the 15 metered households would be a massive R7.764 per kl, generating an average monthly bill of nearly R219 per metered household.

These calculations indicate that it would be financially quite difficult to introduce a phased program of metered stand connections under realistic conditions if subsidies are to be phased out over the proposed 5-year period. Breakeven tariffs

would be unacceptably high under the most realistic assumptions, and more acceptable tariff levels would generate crippling operating deficits. Even if subsidies were extended to 8 or possibly 10 years, breakeven tariffs would remain moderately high, but perhaps not prohibitive.

The lowest feasible monthly payment levels generated above are in the range of R60 to R80 per month per household. This range occurs with subsidies being phased out over a period of 8 or 10 years, rather than the currently announced 5 years. If the bulk water purchase price paid by the WSO were doubled to R2.00 per kl a not-unreasonable figure these average monthly water bills would increase by about half. Although these projections (and the other, higher estimates under various scenarios) seem unacceptably high, further study may not support that conclusion. The only documented evidence available (Fundile Africa 1996) suggests that some households might accept a monthly payment of R20 to R40 for good quality water service (of unspecified volume).

As discussed elsewhere in this report, a phased program to gradually introduce metered stand connections should begin in those communities most capable of accepting such a program. Other communities would respond to the possible expansion of metering in light of the results in the first metered areas. The ultimate acceptability of monthly water bills in the R60-to-R80 range if that were indeed the eventual result of these first initiatives might depend as much on the quality and reliability of the improved service as on its cost.



# 6 ECONOMIC INSTRUCTIONS FOR TRANSITION

This chapter presents some assumptions that can be derived from the discussion thus far and gives suggestions for ways to move forward. The outline of what a longer-term transformation program could be and the type of technical assistance required is proposed. And finally, a short- and medium-term action plan for next steps is suggested.

## 6.1 Key Assumptions for Moving Forward

- # This is a time of major transition in the water sector as well as in local government throughout South Africa. There are a lot of expectations for the transition process (and some may be unrealistically high in terms of how long it will take and how costly it will be). Realism and leadership are needed to adjust expectations to the possible and to move forward.
- # Local authorities will need assistance in making the transition from the present situation to taking full responsibility for water distribution.
- # Transformation will require resources. Help will be required in two forms: technical assistance and financial assistance. Funds will be needed for the transition and capacity-building program and for the necessary equipment to establish water service organizations. Financial support will be required to subsidize the transition to full self-sufficiency for O&M (refer to Appendix E for a discussion of potential subsidy requirements). Local authorities cannot have responsibilities forced on them without help.
- # In order to move forward, the transitional issue must be defined as developing capacity for water distribution structures, not as generically developing local government or building community capacity. Elements of development will need to happen on all fronts, and setting up the water distribution function can provide positive examples to replicate in other areas of need in communities and local government. However, the objective of *capacity-building for water distribution* must be kept clearly in focus if a manageable change process is going to be defined.
- # The most appropriate organization within the governmental structure to support the development of WSOs at any level is the Department of Water Affairs and Forestry, even though it has little experience in this type of transformation process. DWAF will need assistance in developing and managing a type of transition

- program new to it, substantially different from engineering projects it has managed in the past.
- # Relationships among all the key stakeholders are critically important. Roles need to be kept clear. Developing the Bushbuckridge Water Board is one project activity, with a set of goals related to overall bulk water supply and an implementing agent assigned. Development of a water distribution capacity managed by local government is a related but separate activity which will require a different strategy and approach using a technical assistance team rather than an implementing agent. In this setting, provision of water supply and operation of the water distribution system cannot be combined because the functions and interests differ so. To create a balance between water suppliers and end-users, local government must be able to buy bulk water from the new water board at rates which consumers can support.
  - # The specific strategy for transfer of water distribution services to local authorities will need to be developed and a structure for implementation beyond present efforts will be required. A transformation program moving from the current situation to the future must be broadly focused, with attention to human capacity-building at all levels. Technical areas piping systems, maintenance and repair, workshop facilities, etc. will need attention as well. In no sense should the transition be considered a build-operate-transfer (BOT) project.

- # The capacity-building program should be locally focused. Local staff or potential staff with the most appropriate skills should receive training and support from a number of different sources.

## 6.2 Dimensions of the Transformation Program

One of the major recommended actions (mentioned in Section 6.3) is to design a transformation program in its entirety, so that terms of reference can be issued and project implementation begun. A suggested set of goals and a basic framework for the transformation program are presented in this section.

### Program Goal

The goal of the transformation program should be to develop the capacity of future water distribution organizations and community-based water management services in Bushbuckridge, Greater Hazyview, and Nsikazi North.<sup>10</sup> The purpose is to provide improved access to water services for the population in the project area while increasing local capacity for sustainable and participatory management. The ultimate goal of such a program is to improve the health of the population.

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<sup>10</sup> The terminology used by the DWAF policy paper is Water Service Providers (WSP), to denote any organization that processes or distributes water under the management of a Water Service Authority (WSA). In this instance the local government structure is the WSA, and the water distribution organization is the WSP (including Water Committees). In some cases, the WSA may also be the WSP.

## **Key Program Actors**

**As shown in Figure 5, the transformation program for developing water distribution organizations should be a collaborative effort among five broad categories of participants:**

- # Organizational clients (people who will be assisted in learning new roles and the recipients of skill transfer and training and technical assistance activities)<sup>11</sup>  
This group includes 1) staff who will work within the water distribution**

**Figure 5  
Key Program Actors**

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<sup>11</sup>Organizational clients are also referred to as counterparts to describe the relationship between the technical assistance providers (advisors) and those who receive technical assistance (clients).



organizations that are to be set up (i.e., these who fill the jobs described in Chapter 5 in the model WSO); 2) board members or town council members who govern WSOs; 3) the community water committee members who oversee local distribution, collect fees, and manage employees.

- # Sponsoring organization (DWAF or Constitutional Affairs)  
One lead institution will oversee the policy and norms of the water distribution function and secure funding for the transformation process from the national government, international donors, and possibly national nongovernmental sources. The sponsor will be responsible for ensuring that funds are properly used and for monitoring and supporting the transformation program and process.
- # Technical assistance team (TAT)  
Long-term and short-term advisors will support the various organizational clients as they learn how to manage the water distribution function. Long-term advisors should be considered a core group of key individuals who maintain a long-term relationship with local staff (counterparts) over the life of the transformation program to help them develop as managers and set up administrative and technical systems. This TAT core group should be supplemented by specific, short-term consultants who provide specific skill inputs as needed (for example, an accountant could be called in to provide training in bookkeeping).
- # Funding organizations (USAID, RDP, Foundations)  
To date, funding for the Institutional Development Project has been provided by USAID and the RDP; it has been channeled through DWAF. Separate RDP funding has also been provided through DWAF to Mvula Trust to support water committees and community-based programs. The

Leon Foundation Water Program has received private funding to conduct its own program, which supports a number of water-related activities. Some combination of funding from these and/or other donors may continue in the future, but additional funding will also be needed.

- # External technical assistance USAID has provided a small amount of intermittent, external technical assistance in the form of the current EHP team and an EHP consultant in the past. It is assumed that EHP could assist in the future with overall project strategy guidance and monitoring for DWAF and the TAT and also occasional, specific technical training or advice in areas unfamiliar to the core TAT.

### **Program Components**

The program will aim to strengthen human resources; develop systems, structures, and procedures; and provide commodity support (offices, equipment). Areas for performance improvement can be broken down into several components (each area will need specific advisory support):

- # organizational development and structuring
- # human resources development training in managerial and technical skills and capacity-building
- # consumer and outreach programs
- # community water management structure development
- # financial management
- # business structures and administrative systems
- # project and program management; developing a change strategy

### **# technical skills**

#### **Characteristics of the Technical Assistance Process**

The change strategy will need to build a new generation of managers and empower key actors to move forward without external assistance at the end of the transformation program. The technical assistance process should be characterized as enabling, empowering, helping, and supporting individuals who will conduct the daily business of water distribution and serve on boards. Indicators for success for technical assistance will measure the capacity of the WSP and WSA to conduct key business processes without outside assistance. Skills and knowledge acquisition will be demonstrated by successful performance at the individual and the organizational level. If the WSAs are doing the best job they can with the resources they have, water distribution services to the people should improve. However, it is not the responsibility of the TAT to achieve these results; that is the responsibility of the staff working for the WSP. The TAT's job is a helping relationship, not a doing for relationship. The TAT's taking over responsibility for business results (water service provision) would only serve to weaken the clients. Ultimately, the TAT-counterpart relationship should be one of trust. To build this trust the TAT personnel must live and work in the project area and serve as consistent, reliable mentors to the clients, who will be counterparts in a real sense. The TAT must bring technical skills (in key activity areas) and communicative and mentoring

skills (as supportive trainers) to the project.

### **Characteristics of the Technical Assistance Team**

The essential skill areas required of the TAT are the following:

#### *Senior Advisors (long-term):*

- # management and organizational development
- # finance and administration
- # community participation and community management
- # operation and maintenance
- # human resources development

#### *Technical Specialists (short-term/intermittent):*

- # legal issues
- # accounting
- # communications and public awareness
- # computer systems
- # mechanical/technical
- # network maintenance
- # maintenance management systems (setting up standard procedures for maintaining networks)
- # administrative and personnel management
- # health education
- # training
- # strategic planning

### **6.3 Recommended Actions for the Short- and Medium-Term**

If the provisional coordinating committee for the Institutional Development Project finds this issues and options report acceptable and wants to move the process along, a number of specific short-term and

medium-term actions should take place. The short-term timeframe proposed is the four months from November 1997 through February 1998. The proposed medium-term timeframe extends through June 1998.

#### **Short-Term Actions**

- # Revitalize the project coordinating committee and legitimize it.  
Consider renaming the project to reflect its purpose. A possible name might be The Transformation Program for Developing Local Government and Community Capacity for Water Distribution in the Bushbuckridge, Hazyview and Nsikazi North Project Area. Ensure that the coordinating committee has the participation of two permanent representatives from each TLC/LRDC, a representative from the Department of Constitutional Development, Mpumalanga and Northern District representatives, two representatives from DWAF, a BWB representative, five water committee representatives. The coordination committee will eventually become the project steering committee for the transformation program. The organizations and authorities sending representatives should provide written authorization to appoint them formally. Identify a leader for the coordinating committee and empower that leader to act. The EHP team recommends that the DWAF representative act in a key facilitative role

- with (financial) authorizing power for immediate actions or until the program is fully operational.
- # Disseminate this issues and options report.  
A dissemination task team should be formed as a subgroup of the coordination committee. It might be possible to enlist the assistance of the RDP in Mpumalanga to help disseminate the report as well. Those individuals most prepared and willing should plan a series of follow-up meetings with each TLC. The task team should meet for as much as one day with each local council and the LRDC to explain the issues and options report and gather questions. At least two months should be allowed for the local committees to study and digest the report. Questions should be collected and summarized for review by members of the EHP team when they make a follow-up visit (planned for early 1998).
  - # Refocus the strategic plan for the IDP.  
Conduct a three-day strategic planning retreat. It might be possible to engage personnel from the Fredrich Ebert Foundation to act as facilitators, given their involvement in facilitating the original strategic planning meeting in May 1997. Incorporate the proposed program development steps recommended in this report into the strategic plan. Review the action items, aims, and strategies of the plan for possible revision and adjust timelines, adding and dropping items where appropriate.

- Assign task force teams for each goal in the strategic plan.
- # Clarify the funding process for the future IDP and determine availability of funds through all sources.  
The EHP team will speak with USAID staff and ask them to clarify their possible future role. The response will be communicated to DWAF directly by USAID. The coordinating committee should assign a task force to provide follow up.

#### Medium-Term Actions

- # Conduct a follow-up review of the issues and options report. The EHP team should return and meet with the coordinating committee in a workshop to review the draft report and incorporate observations as appropriate. This workshop should occur around February 1998.
- # Further develop a program design for the transformation process, with enough detail to write a project design and scope of work. Develop terms of reference for the technical assistance team. (This could be done by members of the EHP team during their next visit.)
- # Conduct an open solicitation and request for proposals to procure a technical assistance team as a contractor (not an implementing agent). Pending funding, this solicitation and proposal process could take place from March through May 1998.
- # Set up a subgroup of the coordinating committee for project management. This group could include one local

government representative, one RDP representative, one DWAF representative, one TLC/TRC representative, one water committee representative, and the team leader for the technical assistance team (once engaged).

# Begin implementation of the transformation program.

## 6.4 Conclusions

This report has defined issues the essential problem to be addressed as a need to transform water distribution from the present ad hoc situation to a permanent local government structure. Each local government must decide on the exact organizational structure to adopt, given its unique needs and situation. Bulk supply of water is a related, but separate, developmental issue; a transformation strategy for that structure is underway and will continue. The general conditions for transfer of distribution services and the related policies and issues have been described, and a vision for the appropriate characteristics for successful devolution have been presented.



## BIBLIOGRAPHY

- Africon Engineering International, et al. 1996. *Bushbuckridge: Information gathered during fieldwork in August 1996.*
- Africon Engineering International, et al. 1997a. *Preliminary report on bulk water supply for the Bushbuckridge area, Strategic Plan draft no. 3.*
- Africon Engineering International. 1997b. *Proposed GIS and Management System Development for Bushbuck Ridge Water Board.*
- DWAF. 1996a. *Local government support and water supply policy position paper.*
- DWAF. 1996b. *Water law principles.*
- DWAF. 1997a. *Guidelines for training and capacity building on water projects. Version 2.*
- DWAF. 1997b. *National Water Bill, Draft for discussion.*
- DWAF. 1997c. *Transfer of government water works: Policy, guidelines, and procedures to transfer government water supply and sewerage works.*
- Ernst & Young. n.d. *Management audit: The provisional Bushbuckridge Water Board and institutional development project.*
- Edwards, Dan, David Laredo, Tarek Selim, et al. 1995. *Findings and institutional options for future management of water supply and wastewater in the governorates of Fayoum, Beni Suef, and Menya.* EHP Activity Report No. 10, Washington D.C.
- Fundile Africa. 1996. *Social assessment of the impact of a water management institution in the Bushbuckridge/Nsikazi north areas.*
- Government of South Africa. 1996. *National sanitation policy draft white paper.* National Sanitation Task Force.
- Government of South Africa. 1997. *White paper on water policy.*
- GTZ. 1995. *Local government: Mpumalanga province: Strategic planning workshop.* Barberton,
- Hawkins Hawkins and Osborn. 1997. *Bushbuckridge south bulk water pipelines, report on status of infrastructure for repair work.*

- Leon Foundation Water Programme. 1997a. *LFWP water programme steps and components.*
- Leon Foundation Water Programme. 1997b. *Technical pre-assessment of village projects in South Bushbuckridge, Draft report.*
- Mvula Trust. 1997a. *Guidelines for project agents and training agents of Mvula Trust water projects. Version 2.*
- Mvula Trust. 1997b. *Standard forms, documents, and guidelines for water and sanitation project development. Version 2.*
- Pelepele, Lehlohonolo. n.d. *Maintenance management programme report, No. 1. Rand Water Retail Water Operations Department.*
- Pelepele, Lehlohonolo and Linda Meulman. 1996. *Community participation, Rural water supply, and institutional development: A case study of Bushbuckridge, South Africa.* Rand Water, Community Based Water Department.
- Phasha, Mafihle. n.d. *Report on water distribution system from Edinburgh B to Thorndale. incomplete draft.*
- Rand Water. 1996a. *Briefing to the general manager-corporate services: Rand Water on the provisional Bushbuckridge Water Board & institutional development project, June 6.*
- Rand Water. 1996b. *Fact-finding mission to Mozambique, Zimbabwe, and Botswana.*
- Rand Water, et al. 1996c. *Retail water and sanitation study. Phase 1, Volume 1. November 1996*
- Rand Water. 1997a. *Bushbuckridge and Nsikazi North local government technical support project proposal.*
- Rand Water. 1997b. *Establishment of a water board - Bushbuckridge, Business plan. Community Based Projects Department.*
- Rand Water. 1997c. *Operation and maintenance for Bushbuckridge, Business plan. Retail Water Operations.*
- Rand Water. n.d. *Evaluation of 11 water treatment plants in Bushbuckridge.*
- Rand Water. n.d. *Provisional Bushbuckridge Water Board and institutional development project (phase 1), Operation and maintenance report.*

Rall, Martin and Jamie de Jager. 1997. *Greater expectations: Technology choices for community managed water supply in the New South Africa*, Waterlines, Vol. 15 No. 3.

Rees, Judith and Alan Hall. 1996. *Review of the Bushbuckridge institutional development project*, DWAF/ODA.

Seerane, Zulu and Mogakane, Selby. 1996. *Study of the Bushbuckridge and Nsikazi North Regions of the provisional Bushbuckridge Water Board and institutional development project (PBWB & IDP)*. Rand Water.

VSA GeoConsultants. 1997. *Bushbuckridge liaising report (Gazankulu area)*, Draft 2.

(author unknown). 1997. *Locating the research*, Draft report.